A350
TECHNICAL TRAINING MANUAL
MAINTENANCE COURSE - T1+T2 - RR Trent XWB
Communications

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COMMUNICATIONS

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V2414251 - V00T0MM0

HF/VHF SYSTEMS DESCRIPTION (2/3)

General Description of HF and VHF Systems

The HF and VHF communications use the HF and VHF radio frequencies to transmit the data to and from the ground facilities (airline and air traffic control) or another A/C.
These data are:
- Data transmitted and received through the Avionics Communication Routing System (ACRS) for data link functions
- Voice communications transmitted and received through the Radio and Audio Integrating Management System (RAIMS).

The HF system installed on the A/C is used for the long-range voice and data communications (1600 nm). The two HF 1 and HF 2 systems can be used for voice or data communications.
The HF system includes:
- Two identical and interconnected High Frequency Data Radio (HFDR) transceivers (the second one is optional) installed in the avionics compartment
- Two identical HFDR couplers (the second one is optional) installed in the pressurized area near the vertical stabilizer
- A common antenna installed at the lower front part of the vertical stabilizer section.

The VHF system installed on the A/C is used for short-range voice and data communications (250 nm). The VHF system includes:
- Two identical Multiple VHF Data Radio (MVDR) units
- Three identical antennas.

The MVDR unit has two transceivers (Communication (COM) A and COM B). Each unit can supply two VHF channels. Thus, four VHF channels are available.
The VHF 1 and VHF 2 channels are used for voice communication of the flight crew. The VHF 3 channel transmits/receives data communications, but it can also be used for voice communications. A fourth VHF channel is used as a hot spare.
In normal operation:
- The MVDR 1 COM A transceiver controls the VHF 1 channel and uses VHF antenna 1
- The MVDR 2 COM A transceiver controls the VHF 2 channel and uses VHF antenna 2
- The MVDR 1 COM B transceiver controls the VHF 3 channel and uses VHF antenna 3
- The MVDR 2 COM B transceiver is used as a hot spare.

The two MVDRs are interconnected through an Ethernet link to exchange data (transceiver status, etc.).

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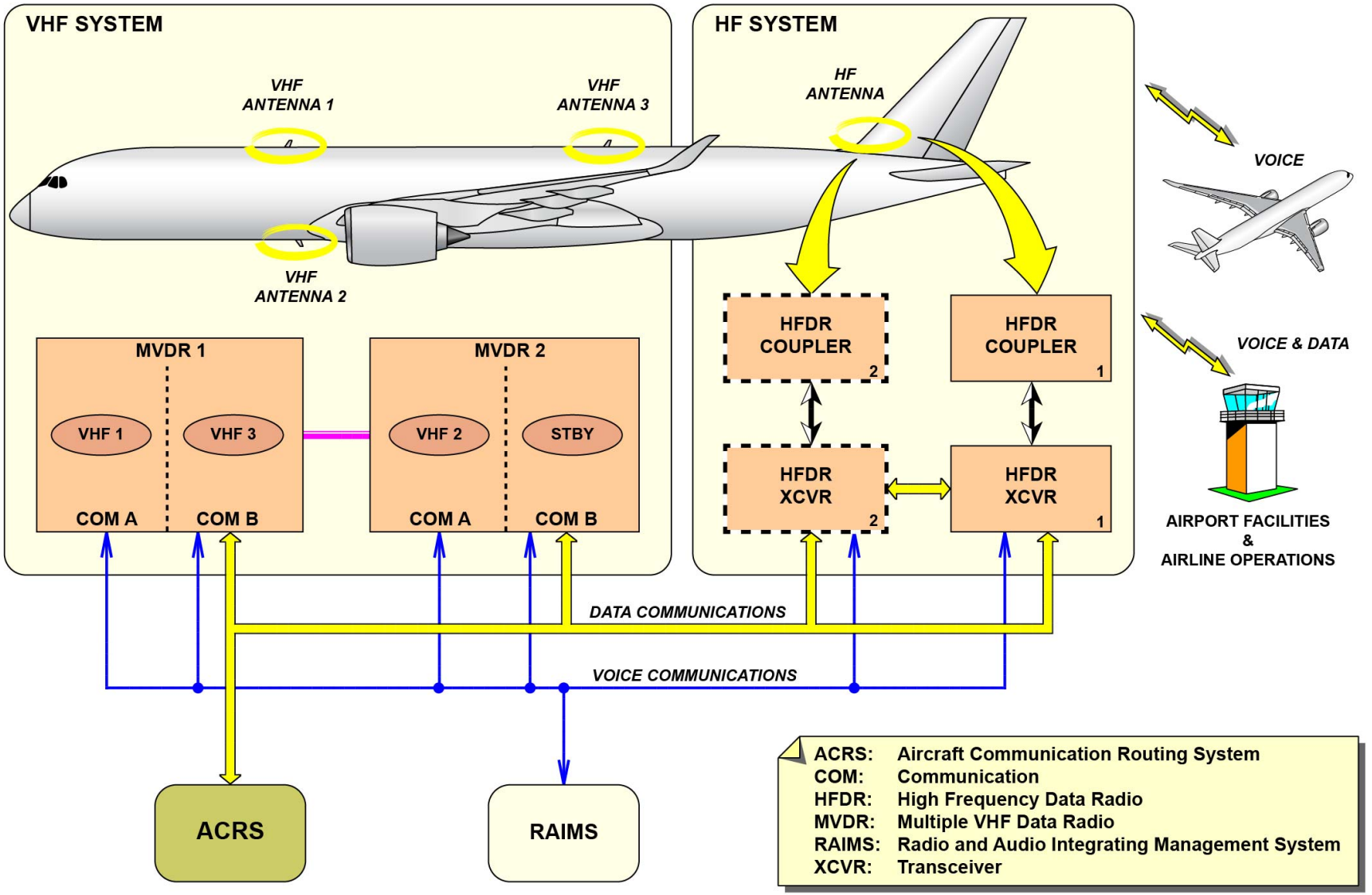

GENERAL DESCRIPTION OF HF AND VHF SYSTEMS

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HF/VHF SYSTEMS DESCRIPTION (2/3)

HF System

The HF system has:
- Two HFDR transceivers (one basic and one optional)
- Two HFDR couplers (one basic and one optional)
- One HF common antenna.

The two transceivers send and receive the HF signals to/from the HFDR antenna through their related coupler. The two transceivers exchange their status through the cross-talk bus ARINC 429.
An interlock function prevents one coupler emission while the other does the emission.
The HFDR transceivers change the HF modulated signals from the A/C HFDR antenna into audio or data signals and vice versa.
The HFDR couplers are used for impedance matching between the A/C HFDR antenna and the HFDR transceivers.
The transceiver does the separation of the audio signal and the Selective Calling (SELCAL) code encoded in the HF modulated signal. Then, the SELCAL code is transmitted to the Audio Management Units (AMUs) which process it. If the received SELCAL code agrees with the A/C SELCAL code, the AMUs send a call signal to the Radio and Audio Management Panels (RMPs) to show the call to the applicable HF system.
The AMUs manage the transfers of the audio signals.
The AMUs connect the cockpit to the HF transceiver in relation to the RMP selections. For voice transmission purpose, the AMUs send the Push-to-Talk (PTT) signal to the HF transceivers.
The RMPs interface is used for:
- HF 1 and HF 2 selection
- Indicating
- Audio level adjustment
- Voice/data switching
- Frequency tuning in voice mode
- Indicating of SELCAL calls.

The Avionics Communication Router (ACR) application manages the transfer of the data signals.
In data mode, the ACR receives the data mode status from the HF transceivers. The HF transceivers process the frequency used. They tune the frequency in relation to the A/C position sent by the Air Data/Inertial Reference Units (ADIRUs).
Note: for safety precautions:
- The HF data transmission is automatically inhibited on ground by the LGERS ground signal. The GND HF DATALINK guarded P/BSW overrides this inhibition.
- The HF transmission in voice and data mode is inhibited on ground during fuel operations (refuel, defuel, transfer operations) through a specific signal from the Fuel Quantity and Management System (FQMS).

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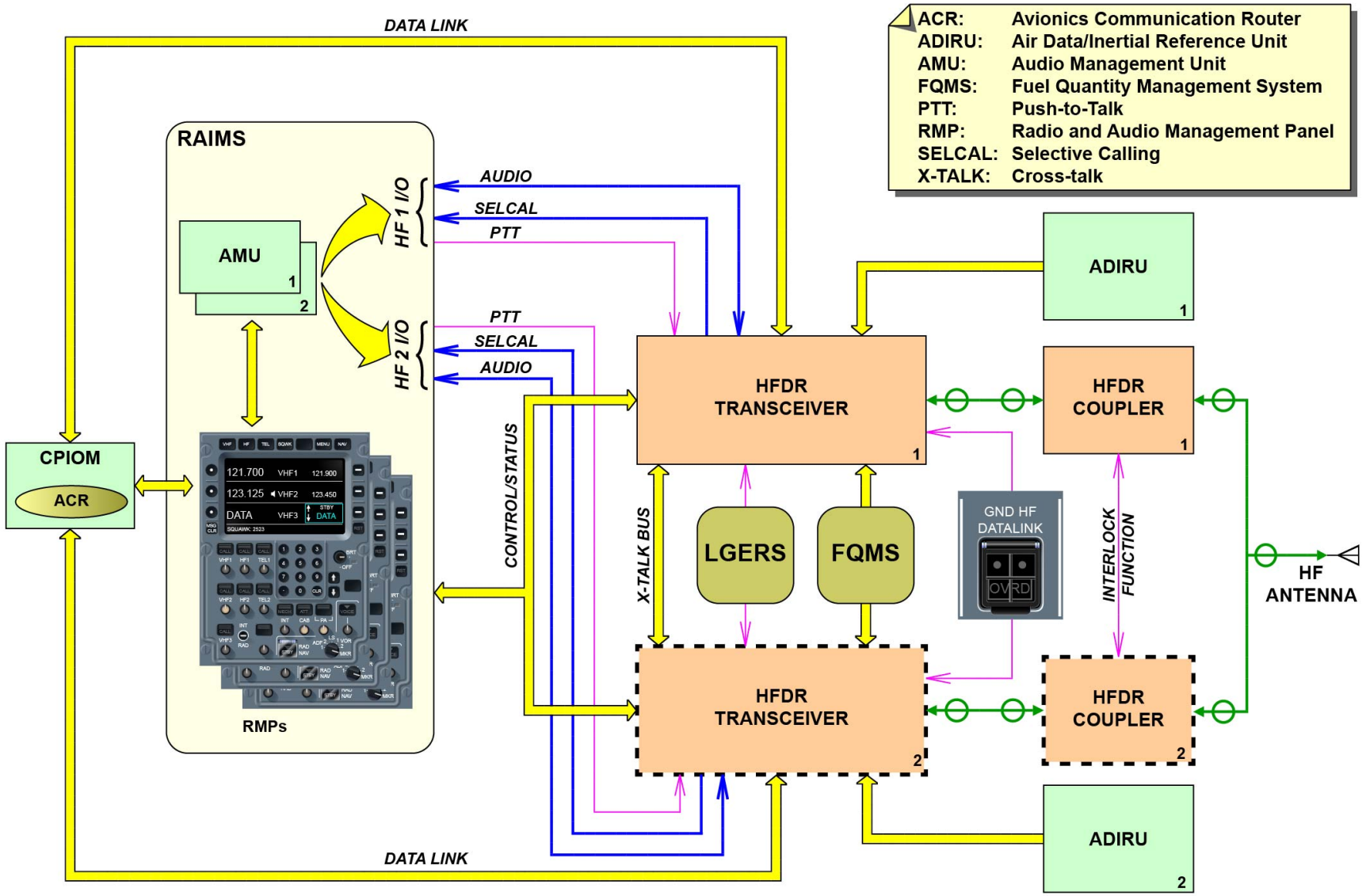

ACR: Avionics Communication Router
ADIRU: Air Data/Inertial Reference Unit
AMU: Audio Management Unit
FQMS: Fuel Quantity Management System
PTT: Push-to-Talk
RMP: Radio and Audio Management Panel
SELCAL: Selective Calling
X-TALK: Cross-talk
DATA LINK
RAIMS
AMU
1
2
HF 1 I/O
HF 2 I/O
AUDIO
SELCAL
PTT
PTT
SELCAL
AUDIO
CPIOM
ACR
121.700 VHF1 121.900
123.125 VHF2 123.450
DATA VHF3 DATA
RMPs
CONTROL/STATUS
X-TALK BUS
HFDR TRANSCEIVER 1
HFDR TRANSCEIVER 2
LGERS
FQMS
GND HF DATALINK
OVRD
INTERLOCK FUNCTION
HFDR COUPLER 1
HFDR COUPLER 2
HF ANTENNA
ADIRU 1
ADIRU 2
DATA LINK

HF SYSTEM

HF/VHF SYSTEMS DESCRIPTION (2/3)

VHF System

The VHF system has two identical MVDRs and three identical antennas. The two MVDR units have two independent VHF transceivers: COM A and COM B that make a total of four independent VHF transceivers available on the A/C. Each VHF transceiver can change the VHF radio signals from its connected VHF antenna into audio or data signals and vice versa.

In normal operation, the three VHF transceivers operate and one transceiver operates as a hot spare:

- The MVDR 1 COM A transceiver controls the VHF 1 channel and uses VHF antenna 1
- The MVDR 2 COM A transceiver controls the VHF 2 channel and uses VHF antenna 2
- The MVDR 1 COM B transceiver controls the VHF 3 channel and uses VHF antenna 3
- The MVDR 2 COM B transceiver is used as a hot spare.

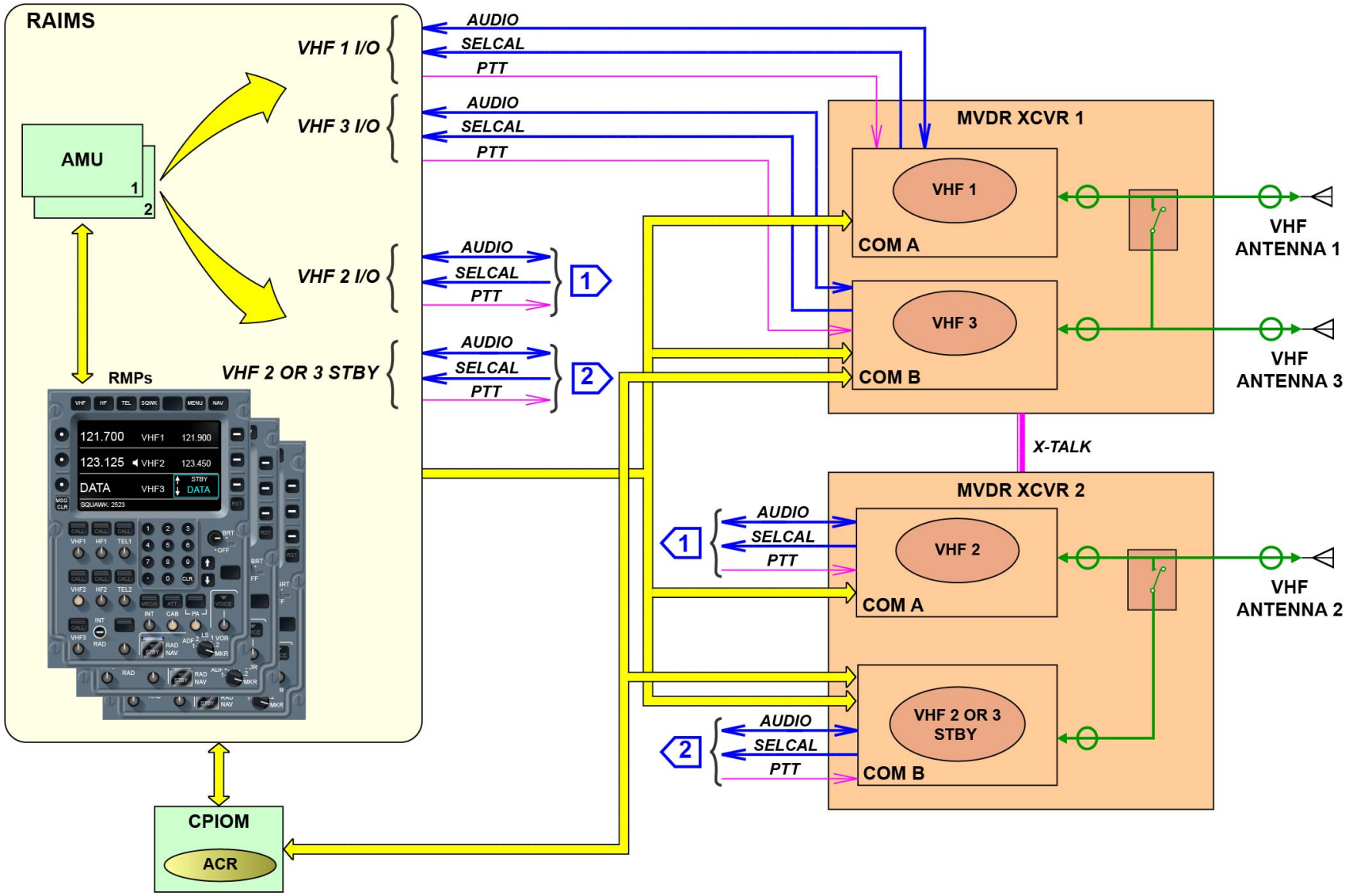
Basically, the VHF 1 and VHF 2 channels are used for the flight crew voice communications. The VHF 3 channel is used for data communications. The fourth VHF channel is used as a hot spare (if there is a failure of one VHF operational channel, it automatically takes over). Only the VHF 3 channel is connected to the ACR for VHF data link. In data mode, the VHF 3 channel sends its data mode status to the ACR and the ACR tunes the VHF 3 channel.

The AMUs process the audio signals and the ACR processes the data signals. The AMUs also send the PTT signal to the transceivers.

The RMPs interface is used for:

- VHF 1, VHF 2 and VHF 3 selection
- Indicating
- Audio level adjustment
- Voice/data switching
- Frequency tuning in voice mode
- Indicating of SELCAL calls.

The VHF transceiver does the separations of the audio signal and the SELCAL code encoded in the VHF modulated signal. Then, the SELCAL code is transmitted to the AMUs which process it. If the received SELCAL code agrees with the A/C SELCAL code, the AMUs will send a call signal to the RMPs to show the call to the applicable VHF system. The cross talk between the two MVDRs is used to exchange information on the VHF transceivers and the antennas status. These data are used for the automatic reconfiguration of the VHF system after the failure of a VHF transceiver or an antenna.



VHF SYSTEM

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HF/VHF SYSTEMS DESCRIPTION (2/3)

VHF System Reconfiguration

If there is a failure of one serviceable VHF transceiver, an automatic reconfiguration occurs on the hot spare transceiver.
For example, if there is a failure of the VHF 1 channel (because of the MVDR 1 COM A transceiver failure), VHF 1 will be automatically reconfigured on the MVDR 1 COM B channel. The VHF 3 channel will be automatically reconfigured on the MVDR 2 COM B transceiver.
In this case, the VHF 2 and 3 channels will share VHF antenna 2.
If there is a failure of the VHF 2 channel (because of the MVDR 2 COM A failure), VHF 2 will be automatically reconfigured on the hot spare MVDR 2 COM B channel.
If there is one VHF antenna failure, an automatic reconfiguration of the VHF system occurs. For example, if there is a failure of VHF antenna 3, the VHF 1 channel (ensured by the MVDR 1 COM A transceiver) and the VHF 3 channel (ensured by the MVDR 1 COM B transceiver) share VHF antenna 1.

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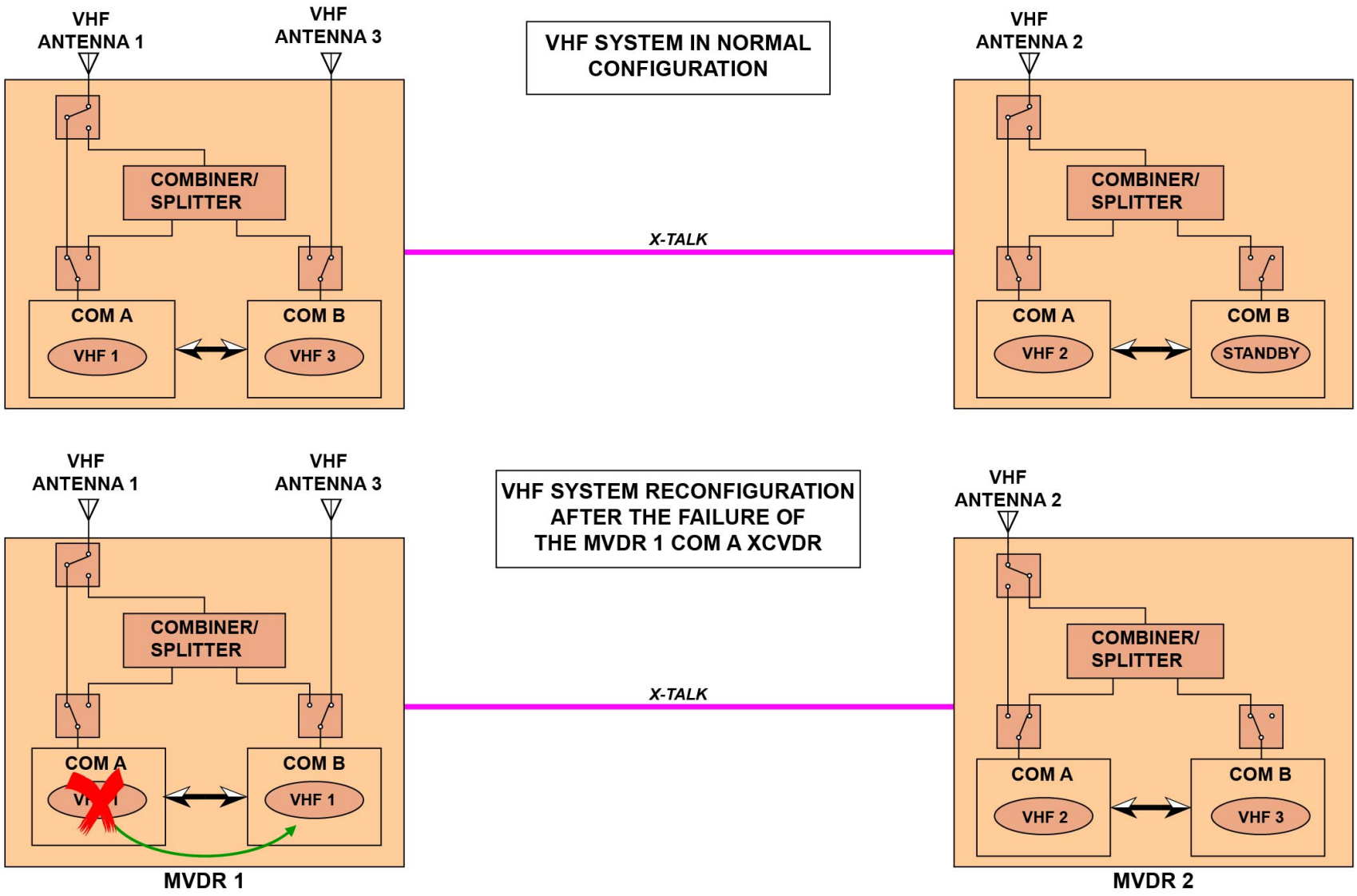

VHF SYSTEM RECONFIGURATION

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SATCOM SYSTEM DESCRIPTION (2/3)

Satellite Communications

The Satellite Communication (SATCOM) system is used for duplex communications (capability for transmission and reception at the same time) between the A/C (in flight or on ground) and ground stations through the satellites. The SATCOM system is used for the multi-channel voice and data communications.
It is used for:
- Voice communications in the cockpit
- Cabin communication services for the passengers and cabin crew (e-mail, telephone, internet, etc.)
- Data link for Air Traffic Control (ATC) and Airline Operational Control (AOC).

The SATCOM system has two subsystems:
- The satellite control subsystem, which changes voice/data signals into L-band radio frequencies (and vice versa)
- The antenna subsystem, which sends and receives L-band radio frequencies.

The satellite control subsystem has:
- A Satellite Data Unit (SDU)
- A SDU Configuration Module (SCM)
- A High Power Amplifier (HPA).

The SDU is the primary component of the SATCOM system. It supplies all the primary services necessary to the air/ground communications through the satellites (voice and data signals conversion and protocol processing of SATCOM signals). The SDU can send and receive data through a high-speed data link for cabin services (telephone, SMS, e-mail, internet, etc. for cabin crew and passengers).
The SCM unit contains cards with the data necessary for the operation of a high-speed communication data link for the cabin services.
The HPA amplifies the Radio Frequency (RF) signal transmitted from the SDU to the applicable power level necessary to keep the communication with the connected satellite. To adjust the power, the HPA receives the beam data from the SDU.
The antenna subsystem has:
- A Diplexer/Low Noise Amplifier (D/LNA)
- A High Gain Antenna (HGA).

The D/LNA segregates the transmitted and received signals and amplifies the received signal.
The HGA is used for full duplex operation (satellite signals are transmitted and received at the same time) through two bands of operation (Reception (Rx) and Transmission (Tx) band). This antenna is electronically steerable. It has a beam steering function that controls the pointing of the antenna beam to the necessary satellite through SDU instructions (A/C and satellite positions, etc.).
The HGA is installed on an adapter plate which makes the interface between the A/C fuselage and the antenna on the top fuselage.

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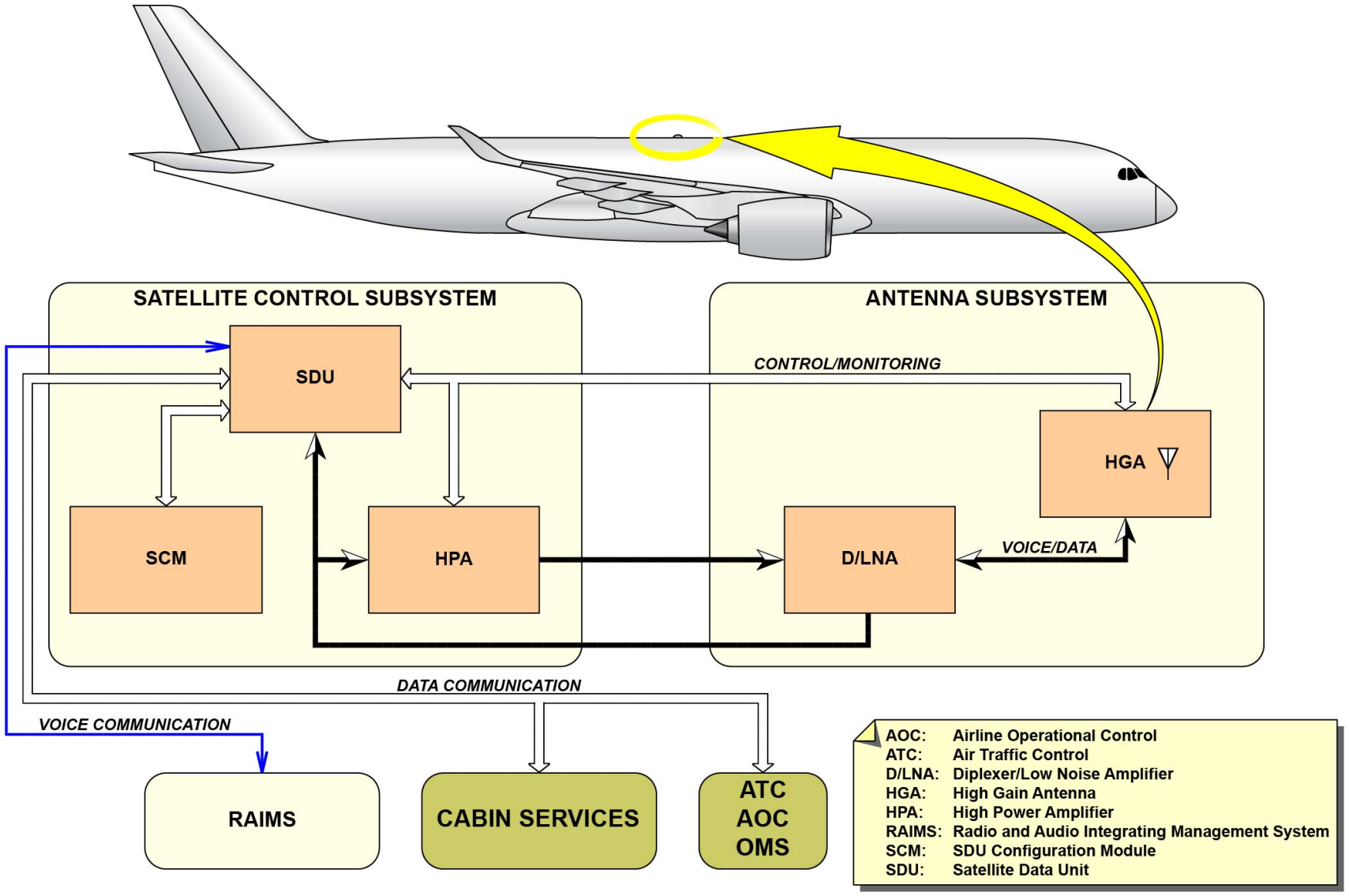

SATELLITE COMMUNICATIONS

SATCOM SYSTEM DESCRIPTION (2/3)

Satellite Communications (continued)

SATCOM system

To use the SATCOM system, it must be logged on. It automatically logs on when the A/C electrical network is energized with the A/C position available from the Air Data/Inertial Reference System (ADIRS) and if the A/C is under the satellite network coverage. But it can be manually logged on through the selection of the log-on command on the related SATCOM menu page on the Radio Management Panel (RMP).

The SDU selects the best adapted satellite in relation to:

- The satellite network coverage
- The A/C position
- The airline preferences (order of preference for the selection of the satellite ground station selection, etc.).

Then, the SDU controls the HGA to point the beam antenna to the selected satellite to make the communication possible.

For the voice and data communication services, the SDU makes the interface with the systems that follow:

- The Audio Management Units (AMUs) and RMPs from the Radio and Audio Integrating Management System (RAIMS) for the cockpit-telephone communications. Two SATCOM channels are used for this function. The RMPs can be used to select or enter a telephone number.
- The Avionics Communication Router (ACR) for ATC, AOC and OMS data link communications. One SATCOM channel is connected to the ACR (a second SATCOM channel can be used in dual ACR optional configuration).
- The OIS for the cabin services (passenger and cabin crew telephone, SMS, e-mail, internet, etc.).

For these cabin services functions, the SDU is connected to the Open world Server Function Cabinet (OSFC) communication manager application. This connection is done through an Ethernet link for the high-speed data exchange based on Internet Protocol (IP) services.

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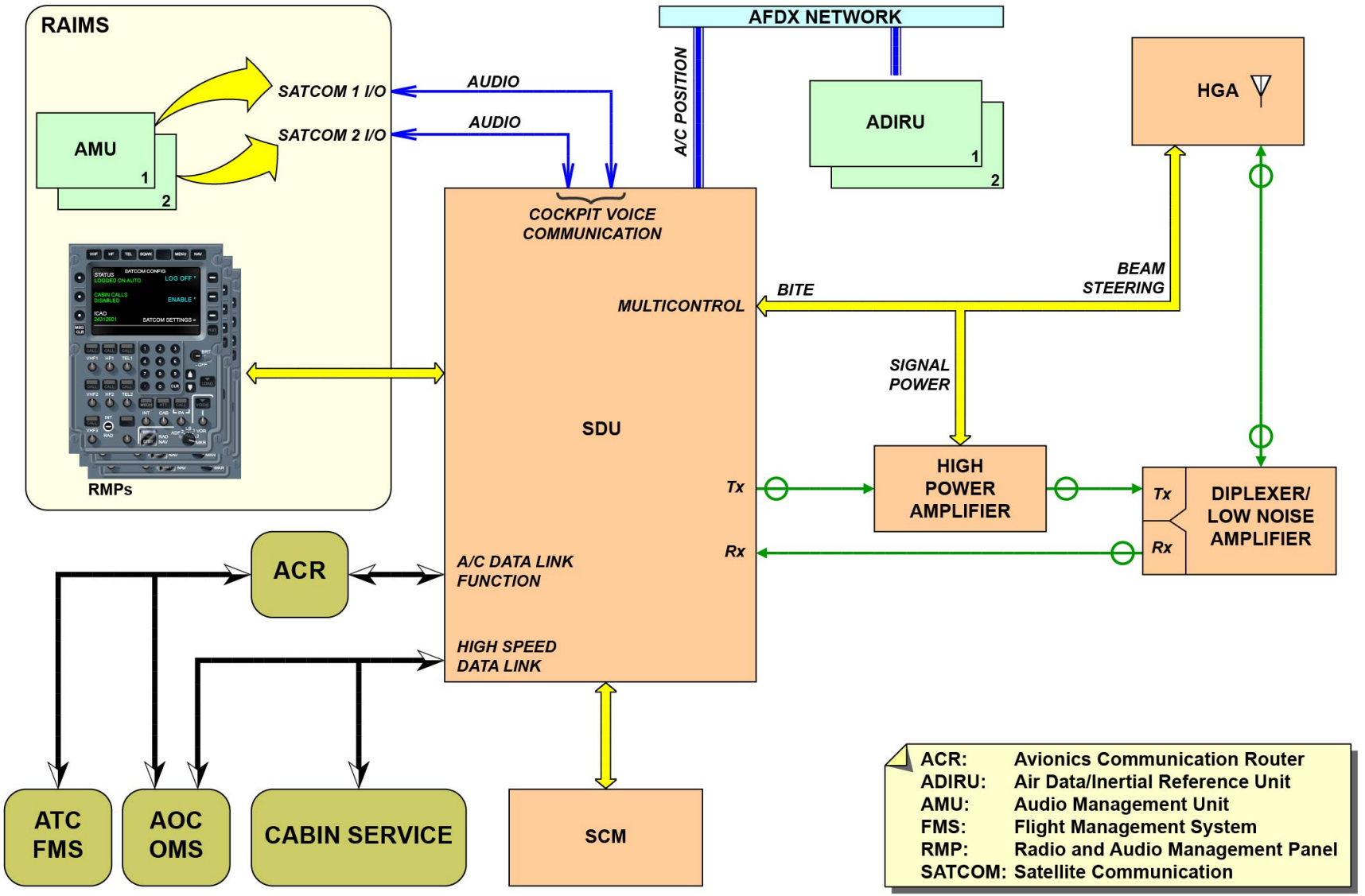

SATELLITE COMMUNICATIONS - SATCOM SYSTEM

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AVIONICS COMMUNICATION ROUTING SYSTEM DESCRIPTION (2)

General

The Avionics Communication Routing System (ACRS) is used for the routing of the air/ground data through the Aircraft Communication Addressing and Reporting System (ACARS) network or the Internet Protocol (IP) network.
The ACRS is connected to the HF, VHF, and Satellite Communication (SATCOM) systems to send and receive the messages to/from the Air Traffic Control (ATC) and Airline Operational Control (AOC) centers through the ACARS network.
The ACRS can also use the IP network for data exchange through:
- The Wireless Airport Communication System (WACS), only on ground
- The SATCOM high speed connection.

The data rate of the IP communications is much higher than the data rate of the ACARS communications.
On the A/C, the users of the ACRS are data link applications such as:
- The ATC for Controller-Pilot Data Link Communication (CPDLC) and A/C data reporting functions
- The AOC for Flight Management System (FMS) data (flight plan, etc.) and flight crew communications with the airline (e-mail, etc.)
- The OMS for communication with AOC for report sending.

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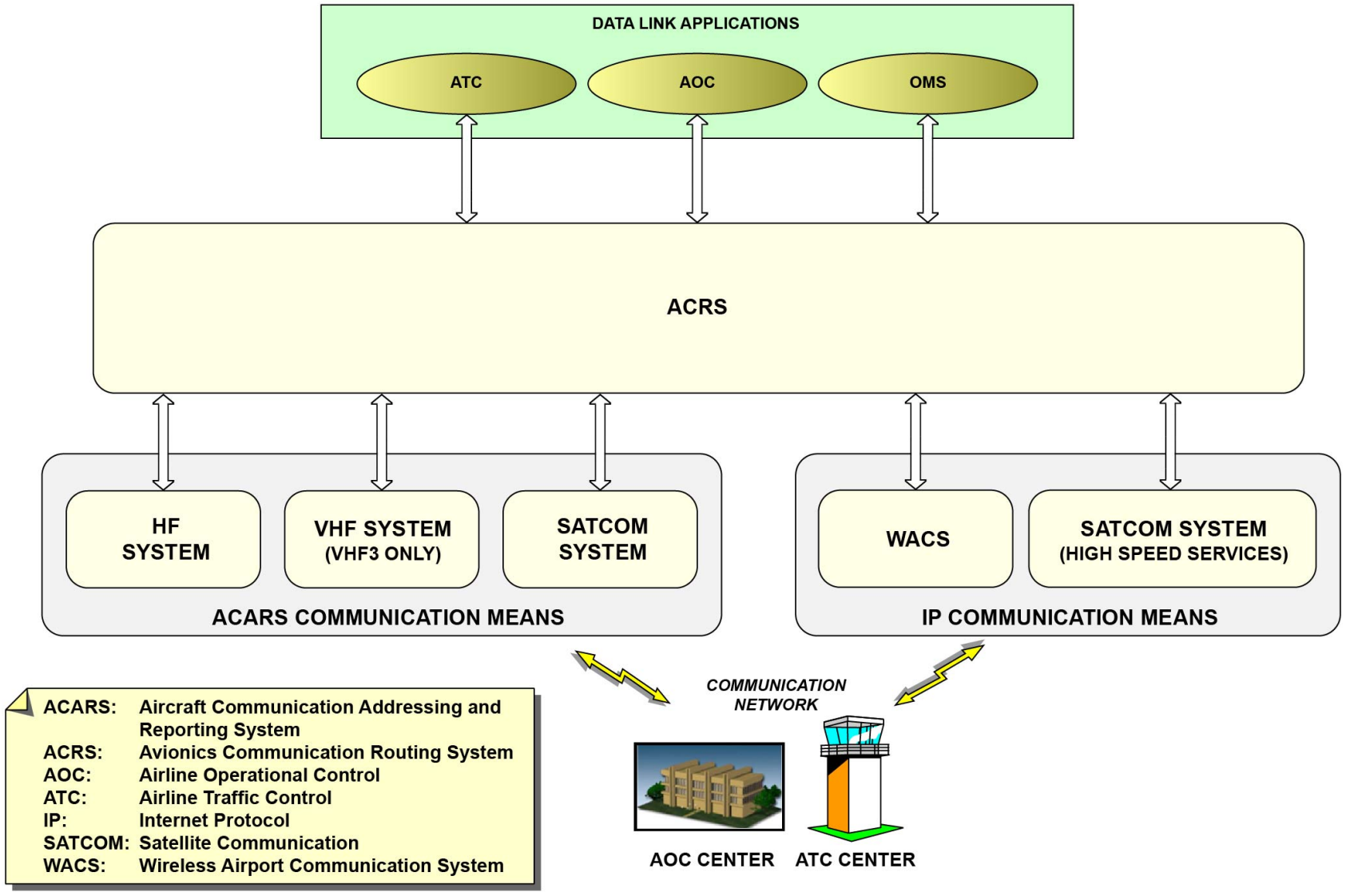
DATA LINK APPLICATIONS
ATC
AOC
OMS
ACRS
HF SYSTEM
VHF SYSTEM (VHF3 ONLY)
SATCOM SYSTEM
ACARS COMMUNICATION MEANS
WACS
SATCOM SYSTEM (HIGH SPEED SERVICES)
IP COMMUNICATION MEANS
COMMUNICATION NETWORK
AOC CENTER
ATC CENTER
ACARS: Aircraft Communication Addressing and Reporting System
ACRS: Avionics Communication Routing System
AOC: Airline Operational Control
ATC: Airline Traffic Control
IP: Internet Protocol
SATCOM: Satellite Communication
WACS: Wireless Airport Communication System

GENERAL

AVIONICS COMMUNICATION ROUTING SYSTEM DESCRIPTION (2)

Description

The ACRS has one Avionics Communication Router (ACR) (optionally two ACRs) application and one ACR Communication (COM) manager hosted in the Avionics Server Function Cabinet (ASFC).
The primary function of the ACR is the routing of data from/to the A/C data link applications through the HF, VHF or SATCOM communication systems. The ACR function is an application hosted in a CPIOM.
In relation to the airline preference settings (subscriptions to data-link service providers, etc.) and the A/C position (processing of VHF, SATCOM or HF coverage) from the Air Data Inertial and Reference Systems (ADIRS), the ACR automatically sends messages from data link applications (ATC, AOC and OMS applications) to the best adapted communication systems. After reception of the data link messages from the ground through the connected communication systems, the ACR sends data link messages to the targeted systems.
The primary functions of the ASFC COM manager are:
- The routing of AOC and OMS data, hosted in the ASFC, to AOC centers through the ACARS network (through the ACR application) or through the IP network (through the WACS or the SATCOM high speed link). This routing is done in relation to criteria (A/C on ground with WACS available, A/C in flight with ACARS network available, airline preferences, etc.).
- The data encoding and compression related to IP communications.
The ACR COM manager is located in the ASFC.

Interfaces

The ACRS gives data link functions to the systems as follow:
- The ATC data link application: to upload and download the ATC messages (CPDLC, A/C data reporting, etc.). The ATC application is hosted in a CPIOM.
- The FMS: the ACR can send or receive the FMS AOC data messages (related to flight plan, etc.) to/from the AOC centers.
- The OMS: the OMS interface is used to upload or download the data messages related to the CMS, DLCS and ACMS. These OMS applications are hosted in the ASFC.
- AOC applications hosted in the ASFC and related to the flight crew services (exchange with airline ground centers of free text, flight folder data, mission data, etc.).
Note: ATC and FMS AOC communications are possible only through ACARS network (i.e. via HF, VHF or SATCOM). Their routing through the IP network is not possible.
Note: the ACARS network or the IP network can download or upload OMS data and ASFC AOC data (i.e. through the WACS or SATCOM high speed connection). The ASFC communication manager will find the most applicable network in relation to airline preferences and airport capabilities.
The ACR is connected to the Radio and Audio Management Panels (RMPs) for control and indication purposes. For example, the ACR status can be shown through the RMPs. Voice/data switching of the HF and VHF communication systems can be managed through the HF and VHF pages.
The ACR is directly connected to:
- The HF system to upload and download messages
- The SATCOM to upload and download messages
- The VHF3 channel to upload and download messages. Note that the ACR directly tunes the VHF3 channel in relation to the data-link service provider selected.
The ASFC COM manager has interfaces with:
- The WACS and SATCOM high speed connection through the Open world Server Function Cabinet (OSFC) COM manager for the IP communications
- The ACR through the Secured Communication Interface (SCI).

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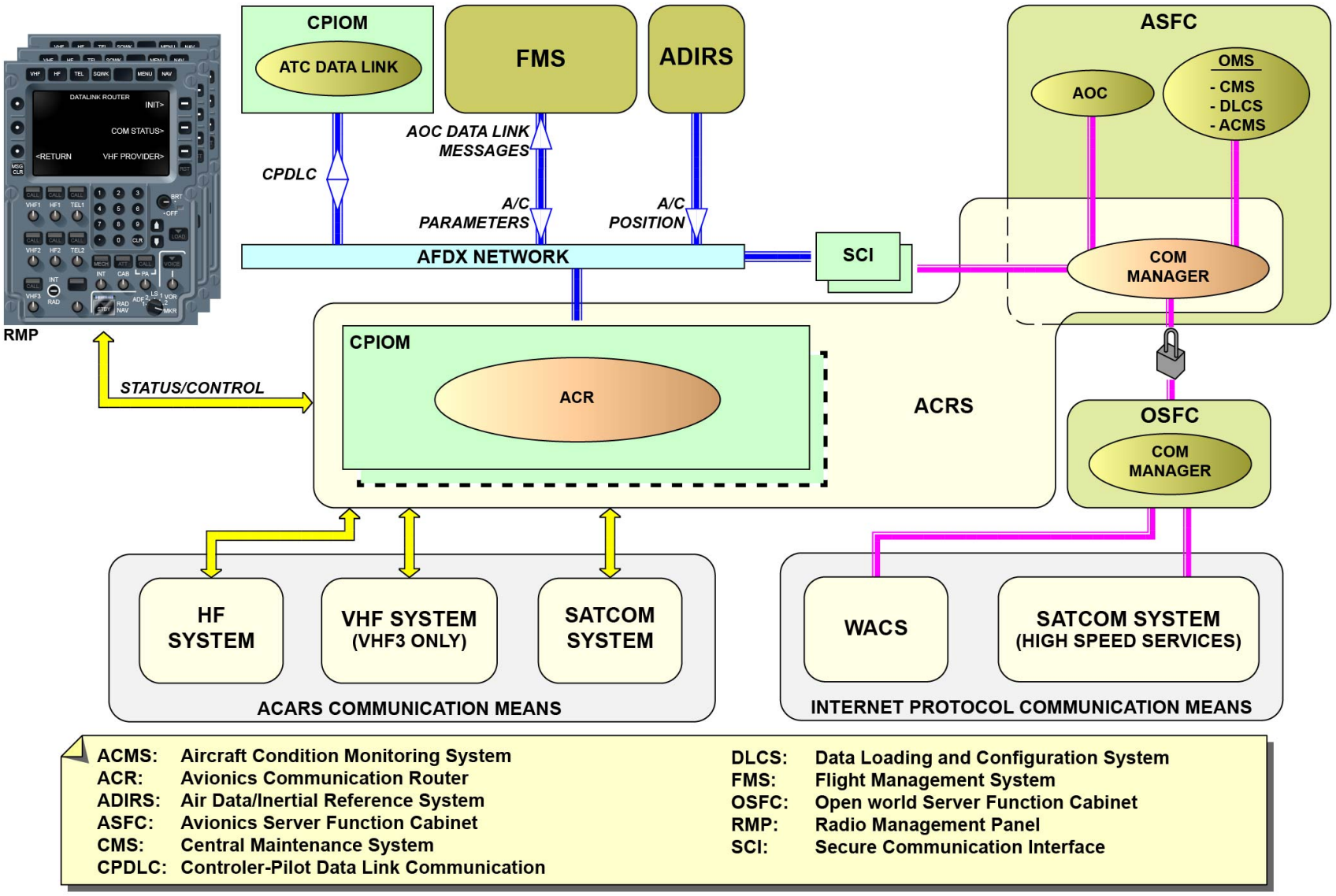

DESCRIPTION & INTERFACES

WIRELESS AIRPORT COMMUNICATION SYSTEM DESCRIPTION (2/3)

General

The Wireless Airport Communication System (WACS) gives wireless and wired communication on ground between the A/C avionics network and the airport ground network. This communication link is commonly referred to as a gatelink.
The WACS is used to exchange data related to the Airline Operational Control (AOC) and the OMS such as the data loading operations.
The wireless communication is based on the two cellular and Wi-Fi (optional) operations.
A gatelink plug also makes the wired connection between the A/C and the airport or airline facilities. This wired connection is done through an Ethernet communication protocol.
The Wireless Local Area Network (LAN) Manager (WLM) software of the WACS controls the data exchange. When the A/C is on ground, the WLM makes sure that the airport has a wireless connection. In these conditions, the WLM controls the WACS transceivers to make the wireless communication possible.
The GATELINK P/BSW stops the WACS data transmission on the ground.

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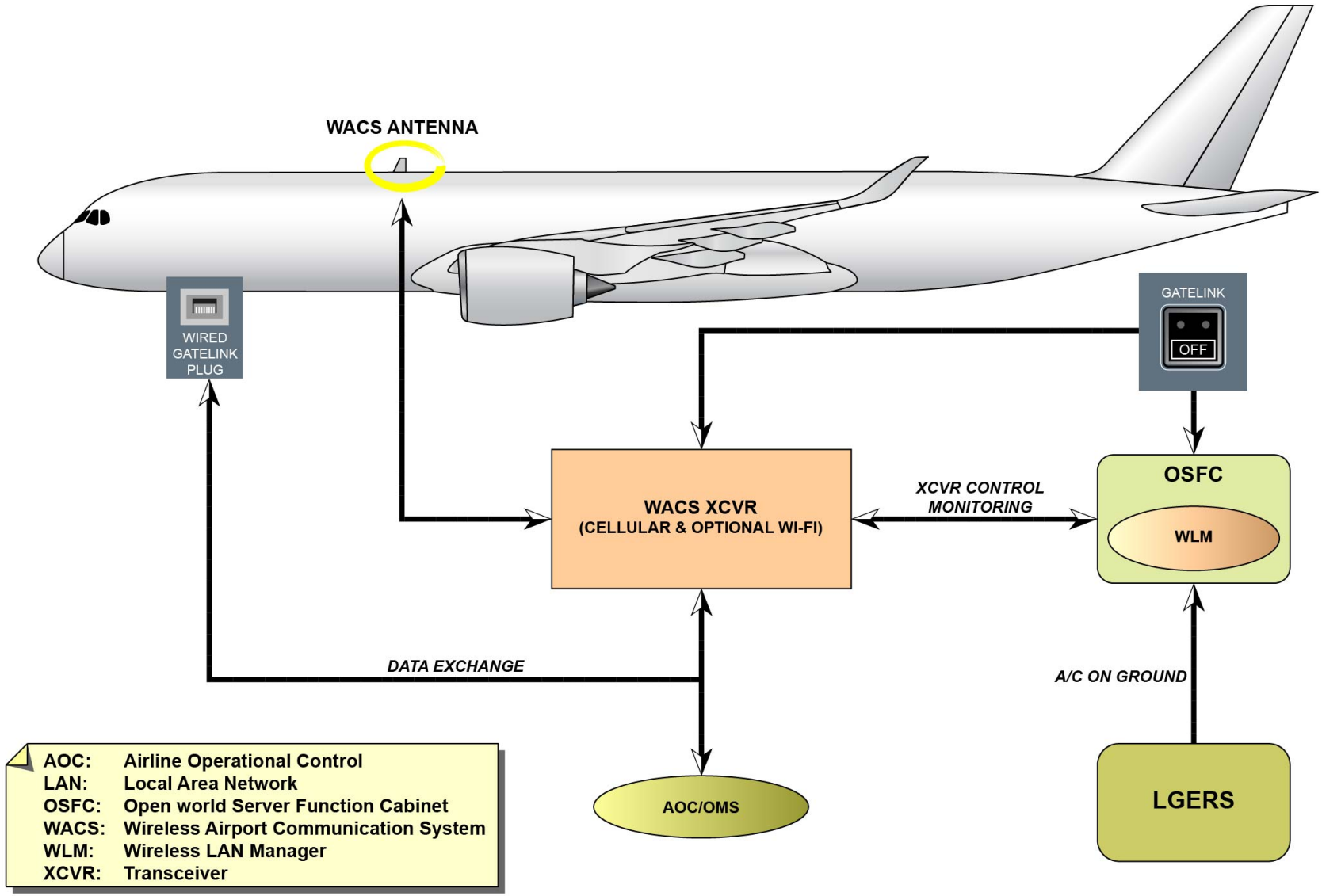

GENERAL

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WIRELESS AIRPORT COMMUNICATION SYSTEM DESCRIPTION (2/3)

Description

The terminal GPRS/UMTS Client Unit (TGCU) (GPRS means General Packet Radio Service Universal Mobile and UMTS means Universal Mobile Telecommunications System) is a multi-standard cellular transceiver which changes the data signal into a radio cellular signal and vice versa.
The Terminal Wireless LAN Unit (TWLU) is an optional Wi-Fi transceiver which changes the data signal into a Wi-Fi signal and vice versa.
The WACS microwave antenna can be used for the two cellular and Wi-Fi operations.
The triplexer is a passive device which can mix the Radio Frequency (RF) signals from the TGCU and the TWLU into a single feed line to the WACS antenna. The triplexer is only installed when the two TGCU and TWLU are installed.
A wired gatelink plug is used for the wired connection between the A/C and an airport or an airline LAN.
A GATELINK P/BSW is used to stop the WACS operation on ground.
The TGCU and the TWLU are connected to the antenna through the triplexer. They send and receive AOC and maintenance data to and from the airport LAN (airline end-user).
The WLM configures and sets the WACS transceivers (TGCU and TWLU) to connect them to the airport LAN.
When it receives the radio power enable signal (GATELINK P/BSW not set to OFF), the WLM makes sure that the A/C is on ground (LGERS data) and if the airport is approved for a wireless connection. If this is the case, the WLM will set a discrete signal (radio on/off) to energize the transceivers.
When the WACS components are energized (power supply and LRU status ok), the WLM sends the WACS settings (airport and airline LAN properties) to the transceivers through the communication manager.
To adjust the WACS transceivers, the WLM uses information from an internal database that contains the airport and airline LAN properties (airport latitude or longitude, standard protocol, channels, GSM and WIFI frequencies, etc.).
When the connection to the airport facilities is serviceable and safe, the AOC and maintenance application data can be exchanged with the airline LAN.
The routing of AOC and OMS data is done through the Open world Server Function Cabinet (OSFC) Communication (COM) manager to the TGCU and TWLU. Then, the triplexer mixes the data which are then sent to the antenna for the communication.
The OSFC COM manager also manages the AOC and OMS routing through the wired connection.

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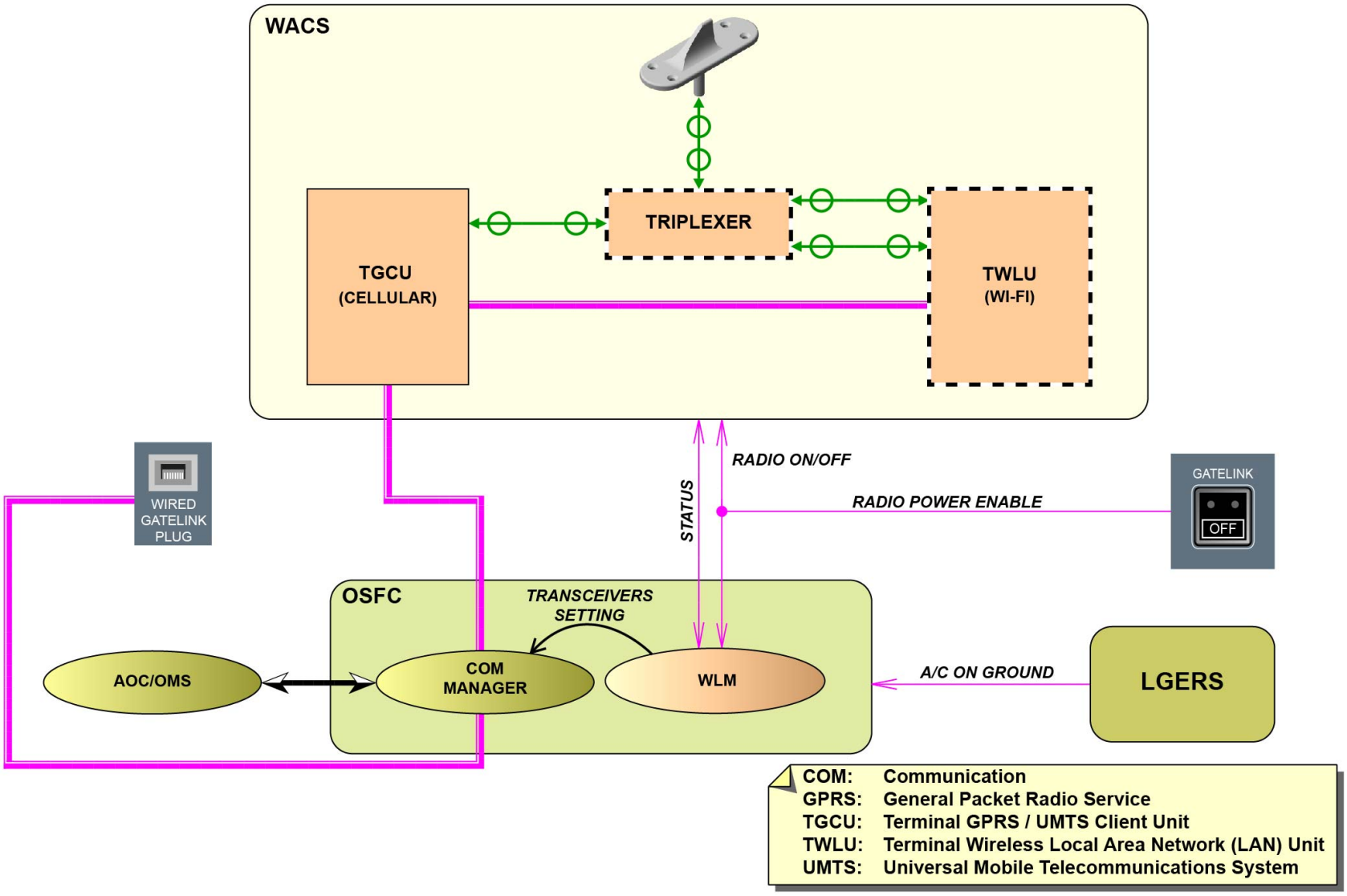

DESCRIPTION

V2414251 - V00T0MM0 - VM23D4WACS03001

RADIO AND AUDIO INTEGRATING MANAGEMENT SYSTEM DESCRIPTION (2/3)

General

The primary functions of the Radio and Audio Integrating Management System (RAIMS) are:
- Cockpit audio management
- Radio and data mode management
- Cockpit selective Calling (SELCAL)/CALL indications
- Cockpit voice communications
- Cockpit voice and audio signal amplification.

The RAIMS is connected to the external communication systems (HF, VHF) and Satellite Communication (SATCOM) to give the flight crew the functions for external voice communications. It also includes interfaces with A/C systems (FWS, Aircraft Environment Surveillance System (AESS), Cockpit Voice Recorder System (CVRS), etc.) for the audio signal management.

The primary components of the RAIMS are:
- Two Audio Management Units (AMUs)
- Three Radio and Audio Management Panels (RMPs). The RMPs are the Human-Machine Interfaces (HMIs) for the radio and audio management. They are also used for the data mode control of the radio communication systems.
- Cockpit acoustic equipment such as boomsets, loudspeakers, hand microphones, Push-to-Talk (PTT) P/BSWs, and also a horn in the Nose Landing Gear (NLG) wheel well. It also includes the cockpit acoustic.

The cockpit audio functions of the AMUs are:
- The radio and voice communications
- The radio navigation
- The interphone
- The aural alert amplification
- The voice and audio signal amplification.

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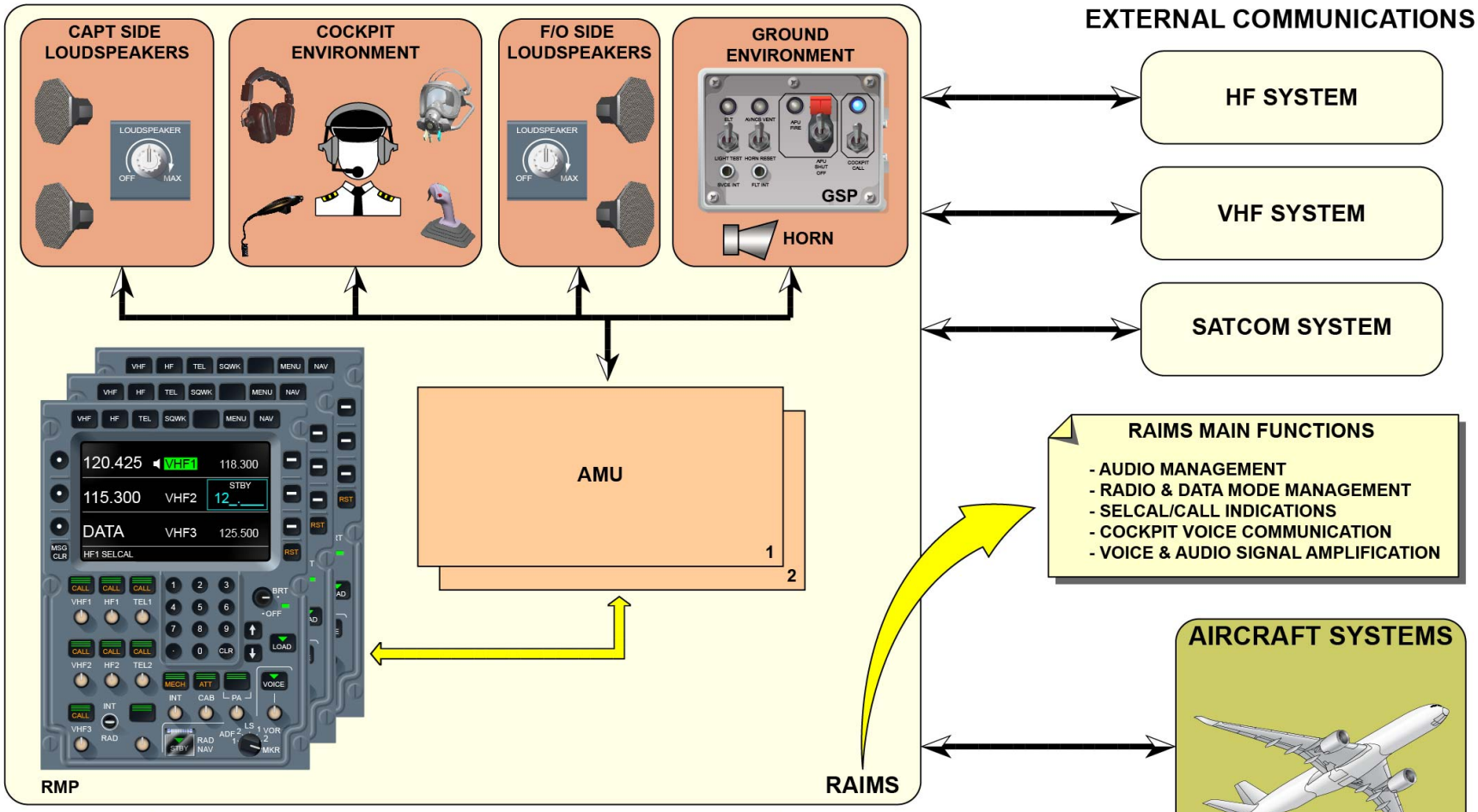


AMU:	Audio Management Unit
GSP:	Ground Service Panel
RAIMS:	Radio and Audio Integrating Management System
RMP:	Radio and Audio Management Panel
SATCOM:	Satellite Communication
SELCAL:	Selective Calling

GENERAL

RADIO AND AUDIO INTEGRATING MANAGEMENT SYSTEM DESCRIPTION (2/3)

Acoustic Architecture

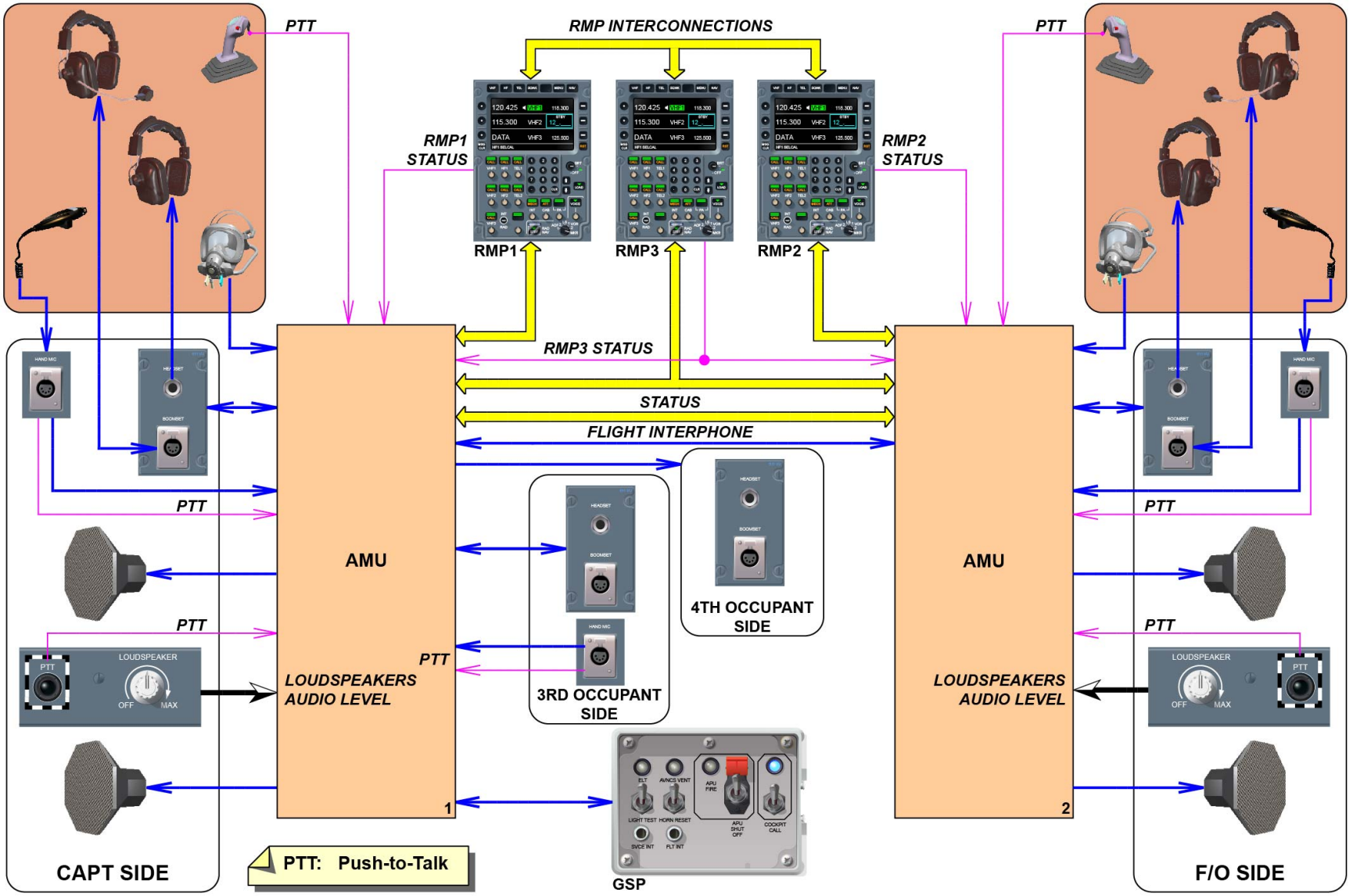
The RAIMS includes:
- Two AMUs
- Acoustic equipment
- Three RMPs for control and monitoring.

The AMUs are connected to the acoustic equipment in the cockpit through plugs. They manage the four loudspeakers (potentiometer and audio output). They receive the PTT signals from the hand microphones, the Side Stick Units (SSU) or the RMPs (interphone/radio PTT P/BSW). An optional PTT P/BSW can be installed near the loudspeaker potentiometers.
The AMU1 is for the CAPT and 3rd Occupant and the AMU2 is for the F/O.
The cockpit occupant, connected to the 4th Occupant station, will hear the same signal as the 3rd Occupant (signal from the AMU1).
The two AMUs are connected to each other through:
- Analog links for the flight interphone function
- ARINC 429 buses for the status function.

The flight interphone is used for the communication between the flight crew members through the cockpit acoustic equipment.
The ground mechanics can also use the flight interphone function of the AMUs to communicate with the cockpit through the FLT INT jack of the Ground Service Panel (GSP) (installed at the NLG).
The audio receptacles make interface between the acoustic equipment (boomsets, hand microphones, etc.) and the AMUs.
A total loss of one AMU causes a total loss of all the functions on the related side and also the loss of the flight interphone.
The three RMPs are connected to each other through dialog buses (ARINC 429 buses) to make sure that each RMP shows the same data.
When data are changed through one RMP (for example VHF and HF frequency change in RMP STBY selection box and activation of the frequency, etc.), the other two RMPs acquire and show the same data.
In normal configuration:
- The RMP1 is used by the CAPT
- The RMP2 is used by the F/O
- The RMP3 is used by the 3rd Occupant.

The RMPs are connected to the AMUs through ARINC buses for the data exchange. The three RMPs send their operational status to the AMUs (through a discrete input) for the automatic reconfiguration in the audio management system if there is an RMP failure.
For example, if there is a failure of the RMP1 (or 2), the RMP3 can be used as a backup of the RMP1 for the control of CAPT voice and radio communications (interphone/radio PTT P/BSW, flight interphone, etc.).
The RMP reconfiguration is done when the operator sets the defective RMP to the off position.

V2414251 - V00T0MM0 - VM23D6AIVCS3001



ACOUSTIC ARCHITECTURE

RADIO AND AUDIO INTEGRATING MANAGEMENT SYSTEM DESCRIPTION (2/3)

Audio Management

The cockpit voice communications can be done through:
- The external communication systems (HF, VHF, SATCOM)
- The flight interphone
- The CIDS for Passenger Address (PA) and cabin interphone functions (given in ATA 44).

The AMUs collect the RMP selections. From these selections, the AMUs manage the audio inputs and outputs to connect the two applicable end-users (cockpit user/communication systems).

The AMUs prevent activation of many communication systems at the same time in transmission mode by one cockpit user. They also prevent the simultaneous transmission through the same communication systems by many users.

The RMPs control the management of the cockpit voice communications with the transmission keys and reception knobs.

In normal operation:
- The CAPT uses the RMP1
- The F/O uses the RMP2
- The 3rd Occupant uses the RMP3.

The AMUs have interface with the radio navigation systems.

From the RMP selection, the cockpit crew can hear the audio signals from the radio-navigation ground stations (morse identification code or specific data in voice mode from the VOR/Marker Beacon (MKR), Automatic Direction Finder (ADF) (optional), ILS, Distance Measuring Equipment (DME), etc.).

The AMUs have interface with the CVRS.

The CVRS/AMU interface is used for the audio recording in the CVR memory. The AMU1 sends the three audio channels (CAPT, F/O and 3rd occupant channels) to the Cockpit Voice Recorder (CVR). The AMU2 sends to the AMU1 the CVR audio signals related to the F/O communications.

The AMUs have interface with the AESS and FWS, which send the audio alerts and warning signals to the AMUs for amplification and transmission through all the loudspeakers and headsets in the cockpit.

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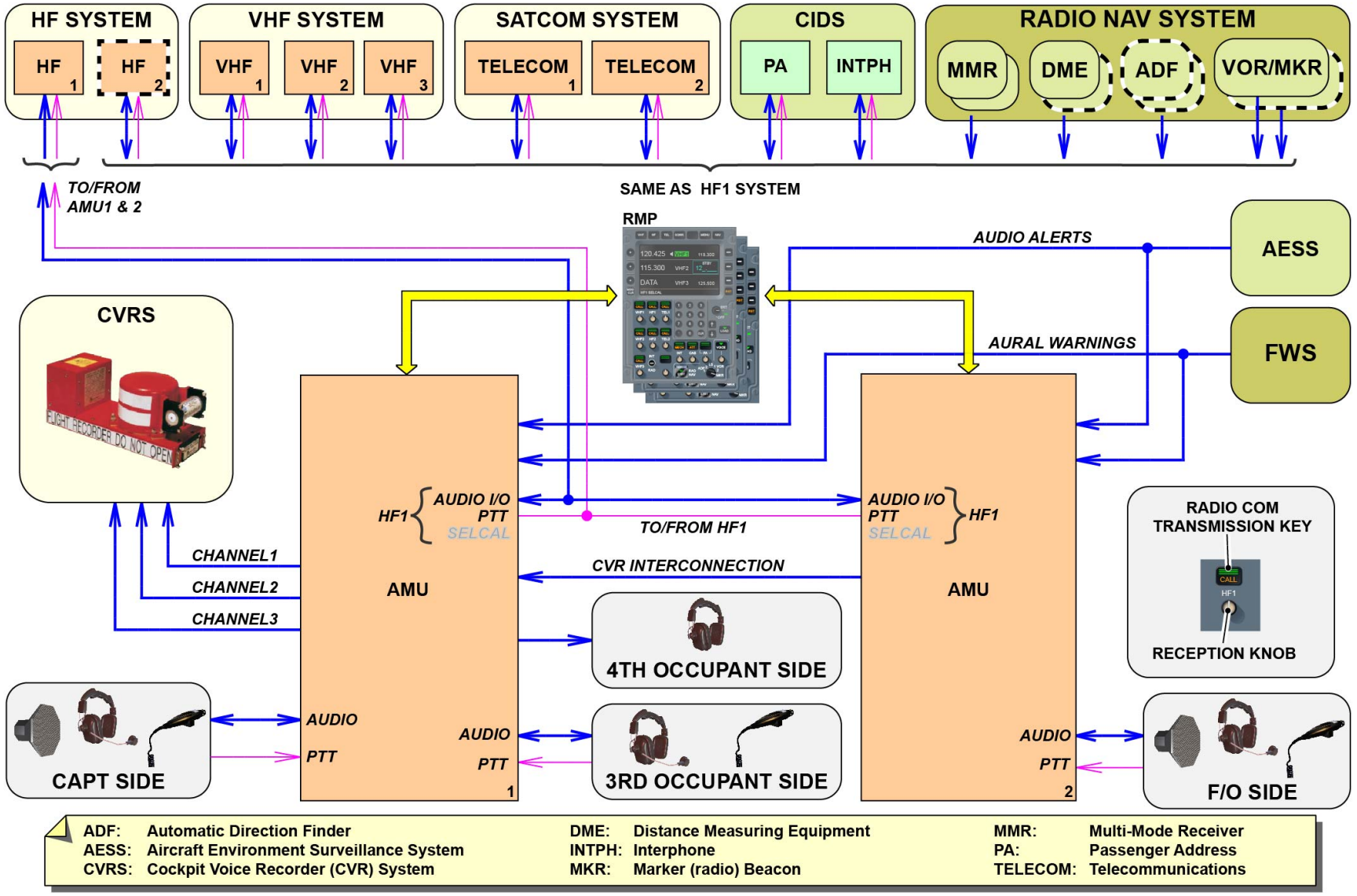


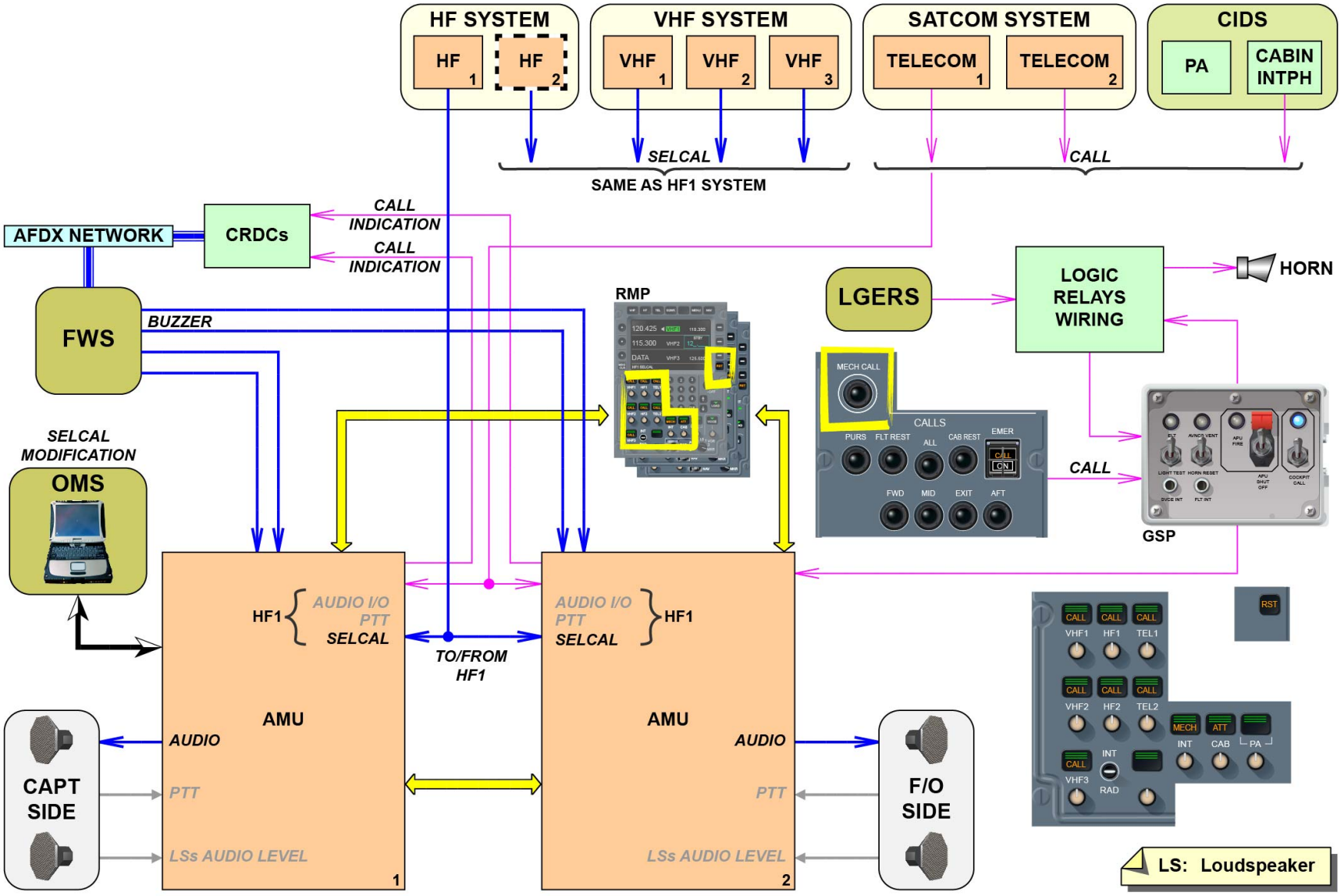
AUDIO MANAGEMENT

RADIO AND AUDIO INTEGRATING MANAGEMENT SYSTEM DESCRIPTION (2/3)

SELCAL/CALL Functions

The AMUs and RMPs manage the SELCAL/CALL functions.
If there is a call to the cockpit, the SELCAL/CALL functions give the flight crew a visual indication on the RMPs and an aural alert. The AMUs send this call indication to the FWS that generates a buzzer in return.
From the radio communication systems (HF, VHF), the calls are identified with a code through a SELCAL code. The AMUs compare the SELCAL signal received from the HF or VHF system to the recorded code (in their memory) and in relation to the A/C specific SEL code. If the two codes agree, the AMUs send the call indication to the RMPs and to the FWS to generate the buzzer sound. You can change the A/C SELCAL code through the OMS.
When the cockpit crew receives a telephone call through the SATCOM or a cabin call through the cabin interphone, the AMUs receive a simple discrete from these systems to identify the call. Then, the visual indications on the RMPs and aural alert (buzzer) are generated.
The cockpit crew can call the ground mechanics at the NLG from the CALLS panel in the cockpit. A logic relay wiring causes a visual indication on the GSP to come into view with an aural alert. This call starts on ground only (LGERS ground signal).
The ground mechanics at the NLG can call the cockpit crew from the GSP. A call discrete is sent from the GSP-logic relay wiring to the AMUs. Then a visual indication is shown on the RMPs and the FWS generates the buzzer.

V2414251 - V00T0MM0 - VM23D6AIVCS3001



SELCAL/CALL FUNCTIONS

V2414251 - V00T0MM0 - VM23D6AIVCS3001

RADIO AND AUDIO INTEGRATING MANAGEMENT SYSTEM DESCRIPTION (2/3)

Radio Management

The RMPs are connected together through the RMP intercommunication bus to show always the same data.
The RMPs manage the radio tuning of the HF and VHF systems.
The RMP1 is directly connected to its onside (side 1) transceivers (XCVRs) through a primary bus and to its offside XCVRs through a backup bus.
The RMP1 onside XCVRs are:
- High Frequency Data Radio 1 (HFDR1)
- Multiple VHF Data Radio 1 (MVDR1) COM A (for VHF1 channel)
- MVDR1 COM B (for VHF3 channel).

The RMP2 is directly connected to its onside (side 2) XCVRs through a primary bus and to its offside XCVRs through a backup bus. The RMP2 onside XCVRs are:
- HFDR2 (optional)
- MVDR2 COM A (for VHF2 channel)
- MVDR2 COM B (for VHF standby channel).

In normal configuration, all the transceivers can be tuned from any RMPs with the RMP intercommunication bus.
The RMP1 primary bus (COM1 BUS1) sends the tuning data to the side 1 transceivers and RMP2 primary bus (COM2 BUS1) sends the tuning data to the side 2 transceivers. As an example, to tune the HFDR2 transceiver with RMP1, tuning data are sent from RMP1 to RMP2 (through an intercommunication bus). Then these data are sent from the RMP2 to HFDR2 XCVR through the RMP2 primary bus (COM2 BUS1).
The RMP3 can be used for the tuning operation if the RMP1 (and/or RMP2) is set to the off position (because of a failure for example). In this configuration, all the transceivers continue to be tuned through the primary buses.
As an example, if the RMP1 is off, the RMP3 can tune the side 1 transceivers via the RMP1 (through COM3 BUS1). Then, the tuning data are sent to the side 1 transceivers through the RMP1 primary bus (COM1 BUS1).
If the RMP3 and RMP1 (or RMP2) are set to the off position, the active RMP can control all the transceivers of the two sides. It can directly tune its onside transceivers through its primary bus (COM1 BUS1 or COM2 BUS1) and the offside transceivers through its backup bus (COM1 BUS2 or COM2 BUS2).

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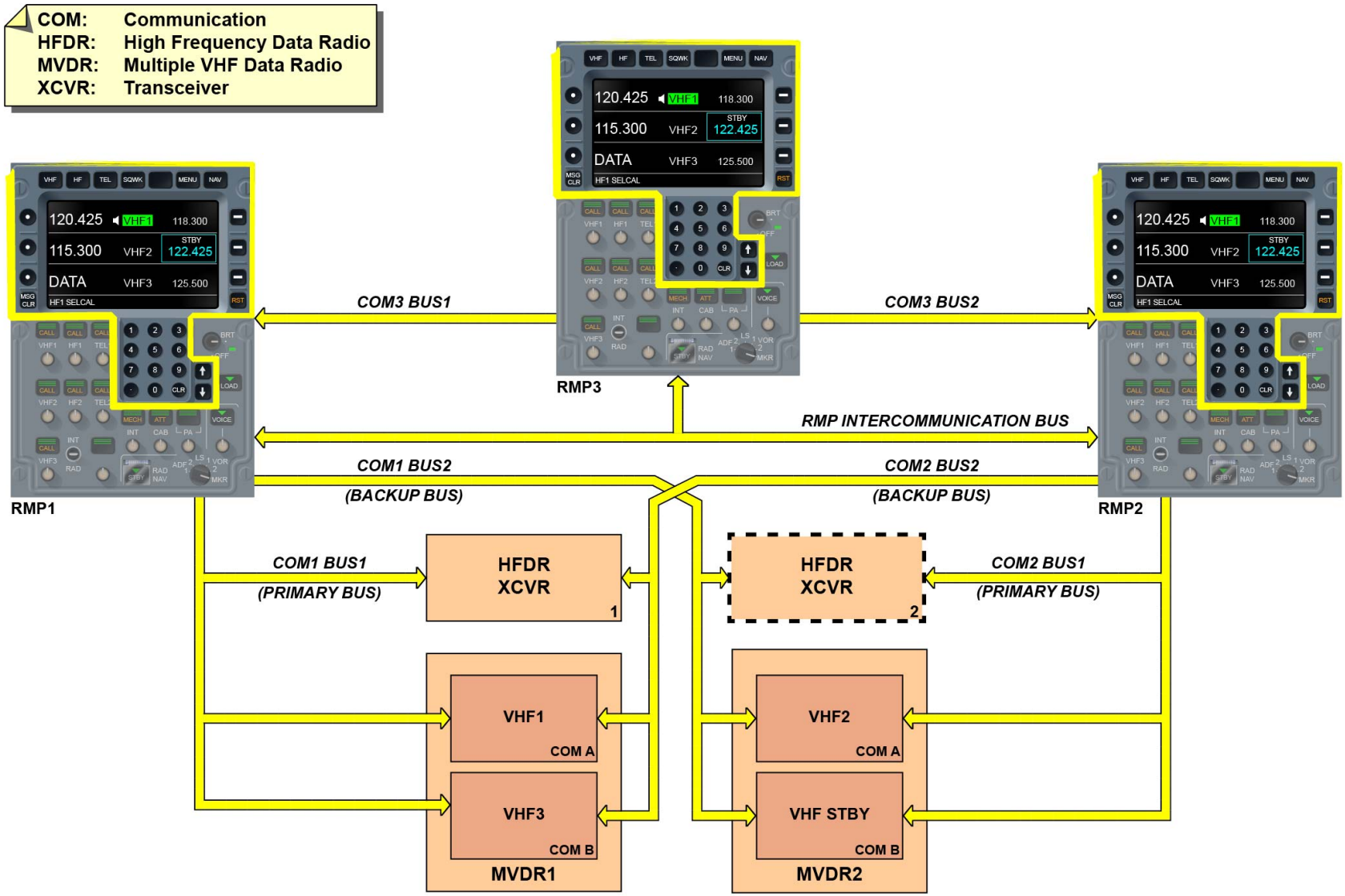


RADIO MANAGEMENT

RADIO AND AUDIO INTEGRATING MANAGEMENT SYSTEM DESCRIPTION (2/3)

Interphone Communication

The A/C has interphone systems for communications between the flight, cabin and ground crew members.
The available interphone communications are:
- Flight interphone
- Ground crew call
- Cabin interphone (ATA 44)
- Service interphone (ATA 44).

Flight interphone system

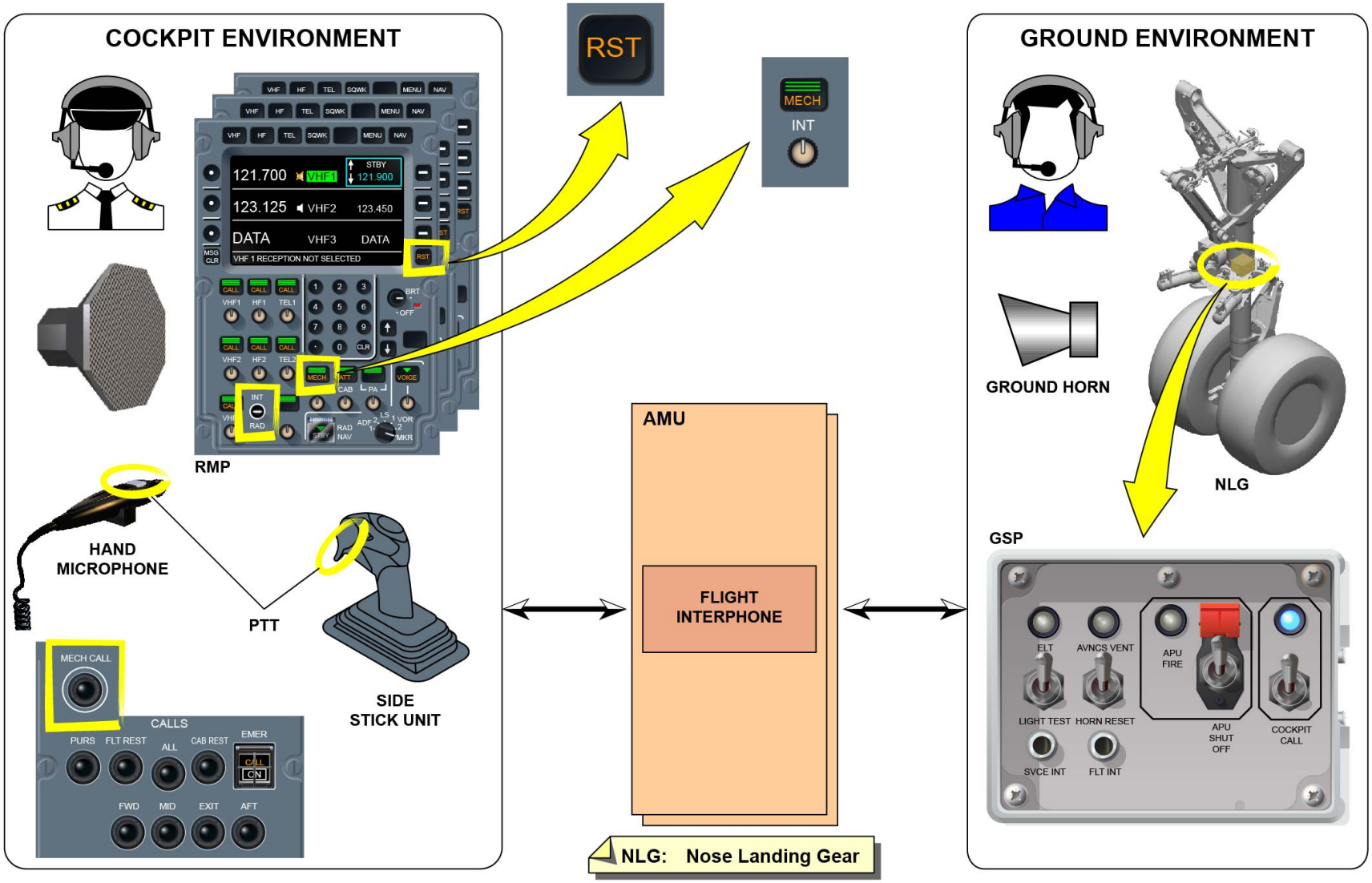
The flight interphone system is hosted in the AMUs.
The flight interphone system is used for the communications between:
- The CAPT
- The F/O
- The 3rd Occupant
- The ground mechanics (through the FLT INT jack on the nose gear).

Note: an action on one of the radio PTT P/BSWs will override the flight interphone.
To communicate through the flight interphone, the flight crew can use:
- The boomsets
- The hand microphones
- The oxygen mask microphones (only the CAPT, the F/O and the 3rd Occupant).

Ground crew calls

If a ground mechanic calls the cockpit from the GSP, an indication is shown on the three RMPs and the FWS triggers the buzzer.
The cockpit crew can call the ground mechanics from the CALLS panel. This action operates the horn at the NLG area and a specific indication on the GSP comes into view. The horn operates while the MECH CALL P/BSW is pushed.

V2414251 - V00T0MM0 - VM23D6AIVCS3001



INTERPHONE COMMUNICATION - FLIGHT INTERPHONE SYSTEM & GROUND CREW CALLS

EXTERNAL VIDEO SYSTEM DESCRIPTION (2/3)

General

The external video system has two subsystems:
- The Taxiing Aid Camera System (TACS)
- The landscape camera.

The TACS has:
- A belly Taxiing Aid Camera (TAC)
- A vertical stabilizer TAC.

They give external video images on the Display Units (DUs) of the CDS through the Concentrator and Multiplexer for Videos (CMVs). They help the flight crew during taxi maneuvers.
The optional landscape camera-image comes from the CMVs and is sent to the IFE system for cabin entertainment purposes.
Optionally, the TACS camera images can also be given to the IFE for display to the passengers.
The CMVs put the images that come from the belly and vertical stabilizer TACs on a same display in a mosaic format on a 1/3 - 2/3 basis. The flight crew can show the TACS image on the SD or on the PFDs.
Indicated inserts and ground speed are also shown on the display to help the flight crew during the taxi operations.
After a vertical-stabilizer camera change, it can be necessary to readjust the inserts shown. This maintenance procedure is done through the OMS.

Description

The two CMVs receive video signals from the three cameras of the external video system through optical fiber links.
The CMV1 receives images from the belly TAC and the landscape camera.
The CMV2 receives images from the vertical stabilizer TAC.
The CMV1 receives images of the vertical stabilizer TAC from the CMV2 to make the TACS mosaic through an optical crosslink.
The CMV2 receives the belly TAC images from the CMV1.
The CMVs send this TACS mosaic to be shown on the PFDs and on the SD via an optical fiber wire and on flight crew request.
The CDS receives inserts processed by the CMVs and shows the ground speed of the A/C received from the Air Data/Inertial Reference System (ADIRS). Then, it superimposes these data on the TACS mosaic.
The TAXI keys located on the EFIS control panels allow the flight crew to show the TACS video image on the PFDs.
The VIDEO key installed on the ECAM control panel allows the flight crew to show the TACS video image on the ECAM SD.
The external video system has an interface with the TACS lights. The TACS lights are installed on the A/C to give sufficient light (at night or in dark condition) to the filmed areas during maneuvers on the taxiway.
These TACS lights come on in the conditions that follow:
- On ground only
- When the TACs video image is shown (on PFD or SD DUs) on flight crew request
- When the runway turnoff and taxi cameras SW is set to on position on the external light panel.

The activation signal of the TACS video image is sent by the CMV1 and CMV2 to the external lighting system through the AFDX network.
The interfaces with the IFE system are as follow:
- The CMV1 has an output for IFE purpose
- The CMV2 sends its video images to the CMV1 through the Ethernet crosslink to be routed to the IFE system.

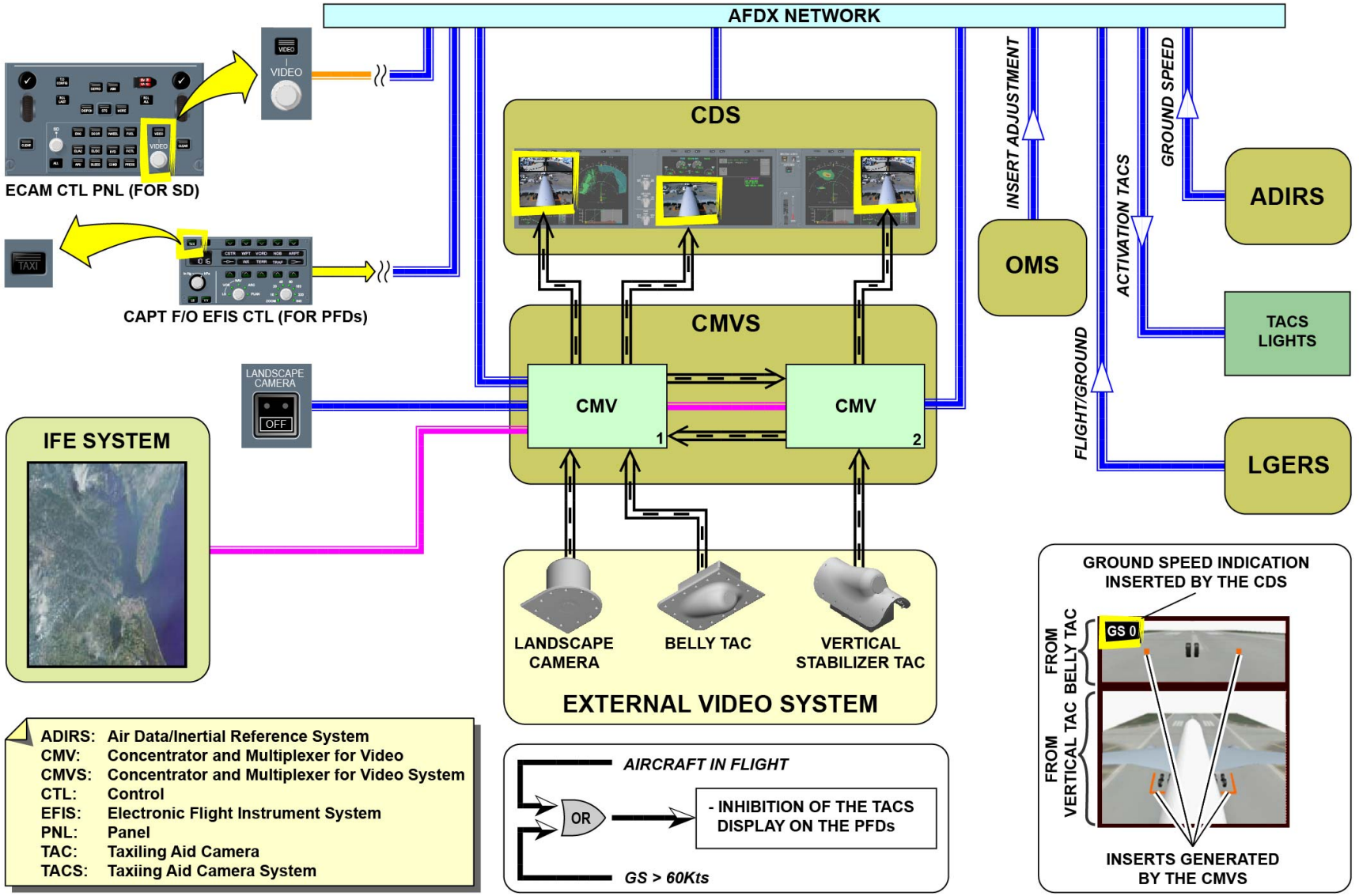
As an option, the vertical stabilizer camera, the belly camera and the landscape camera images can be sent continuously to the IFE system for cabin entertainment. In that condition, no TACS mosaic is done and there is no insert on the display. The picture is a full range display.
The flight crew can stop the display of the camera images in the cabin through the LANDSCAPE CAMERA P/BSW installed on the overhead panel.

V2414251 - V00T0MM0 - VM23D8EXTVI3001

Display Management

On the PFD displays (CAPT, F/O), the TACS video images are available on the CDS when:
- The A/C is on ground
- The ground speed is not more than 60 kts.

When the ground speed reaches 60 kts, the EFIS control panels receive from the PRIMary (PRIM) system a TACS inhibition data which deactivates the control keys. Thus, the CDS stops the TACS video display on the PFDs.
The flight crew must select the applicable control keys again to show the TACS mosaic on the PFDs when the A/C lands and the ground speed decreases to less than 60 kts.
The TACs image can be displayed on ground and in flight on the SD.
The TACs specificities are:
- Heating system for the electronic components in the camera
- De-icing system for the window.



GENERAL ... DISPLAY MANAGEMENT

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V2414251 - V00T0MM0 - VM23D8EXTVI3001

COCKPIT VOICE RECORDING SYSTEM DESCRIPTION (2/3)

General

The Cockpit Voice Recording System (CVRS) records in the Solid State Cockpit Voice Recorder (SSCVR):
- The conversations and audio communications of the flight crew (with cockpit acoustic devices and cockpit area microphone)
- The data link communications with the Air Traffic Control (ATC) center.

These recorded data give help in investigations after an A/C accident or incident.
Note: the Cockpit Voice Recorder (CVR) has a minimum of two hours of recording time.

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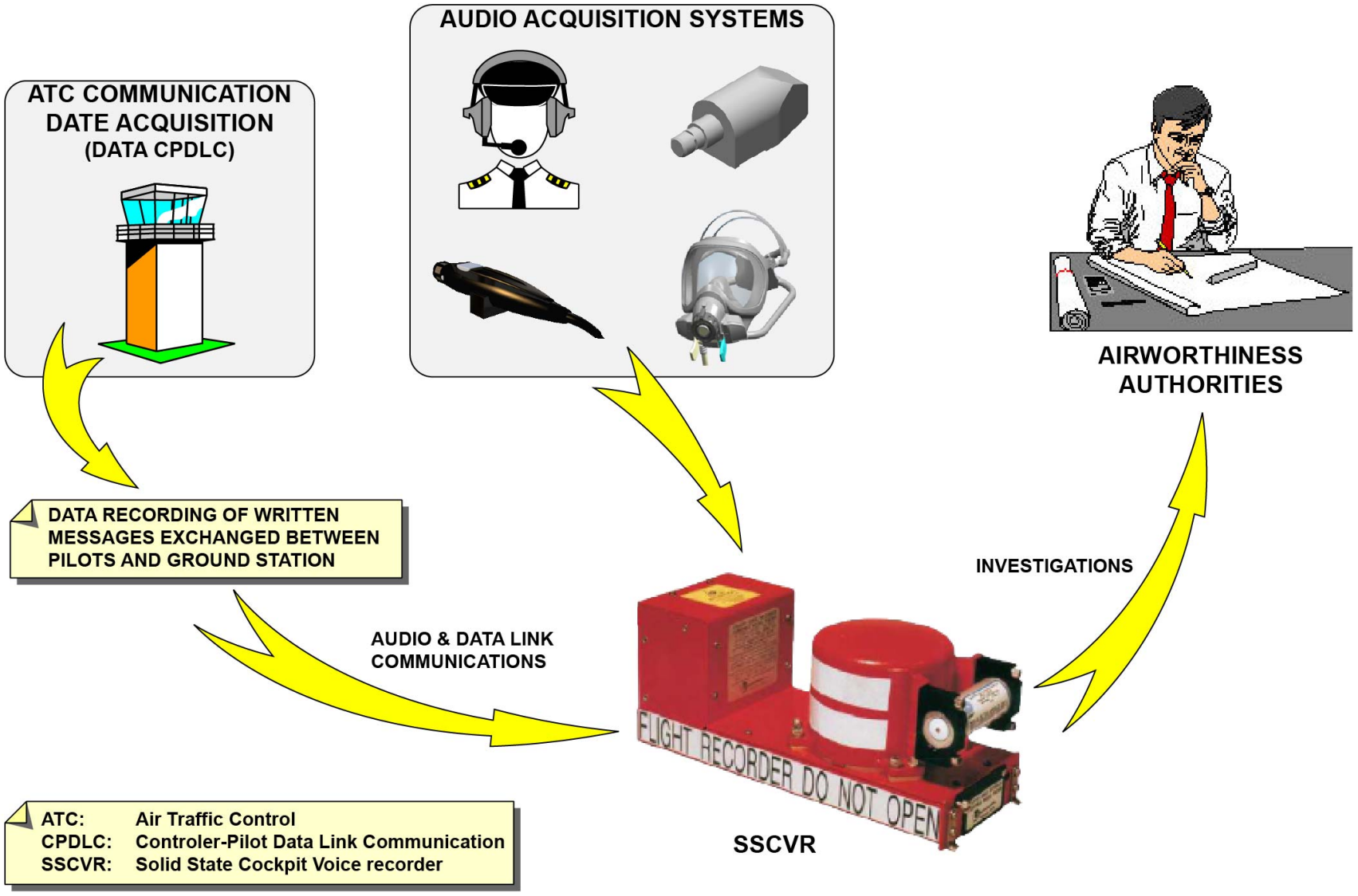

AUDIO ACQUISITION SYSTEMS
ATC COMMUNICATION DATE ACQUISITION (DATA CPDLC)
AIRWORTHINESS AUTHORITIES
DATA RECORDING OF WRITTEN MESSAGES EXCHANGED BETWEEN PILOTS AND GROUND STATION
AUDIO & DATA LINK COMMUNICATIONS
INVESTIGATIONS
FLIGHT RECORDER DO NOT OPEN
SSCVR
ATC: Air Traffic Control
CPDLC: Controler-Pilot Data Link Communication
SSCVR: Solid State Cockpit Voice recorder

GENERAL

COCKPIT VOICE RECORDING SYSTEM DESCRIPTION (2/3)

Description

The SSCVR includes:
- An Underwater Locating Beacon (ULB), whose function is to emit audio signals when it is immersed into the water. The ULB is a battery-operated device.
- A digital memory unit component installed in a crash resistant housing and which contains the recorded data.

The CVRS records three audio channels from the Audio Management Unit 1 (AMU1) only. These three audio channels are for the CAPT, FO and 3rd Occupant audio-recording.
These audio channels record the radio, flight interphone and Passenger Address (PA) communications.
The fourth audio channel comes from the cockpit area microphone. It records all cockpit sounds such as:
- Direct crew conversations
- Aural warnings
- Navigation-aid identification signals.

The CVR Control Unit (CVR CU) amplifies the signal that comes from the cockpit area microphone.
The CVRS also records the data link messages (written messages interchanged between pilots and ATC) from ATC applications.

Recording logic

The CVRS recording is started related to a CVR logic (relays wiring) in relation to A/C conditions.
In automatic mode, the CVRS is in recording mode in the conditions that follow:
- On ground during the first five minutes after energization of the A/C electrical network
- On ground with one engine-master control switch minimum set to ON
- In flight
- On ground for five minutes after the last engine shutdown.

In manual mode, when the Recorder Ground Control (RCDR GND CTL) P/BSW is engaged, the CVRS is in recording mode in the conditions that follow:
- On ground with no engine master control switch set to ON
- A/C electrically energized for more than five minutes.

This P/BSW is used to simulate flight conditions on ground with all engines stopped and then, it is used to set the CVRS in recording configuration.
The LGERS gives the A/C flight and ground configuration.

CVR control unit

The central socket on the CVR control unit is used to monitor the audio recording (all combined recording audio channels). When a boomset is connected to this socket, the user can listen to the recordings. The user can also listen to the audio indication of the PASS status of the test and erase functions.
The other function of the CVR control unit is to amplify the audio signal that comes from the cockpit area microphone.

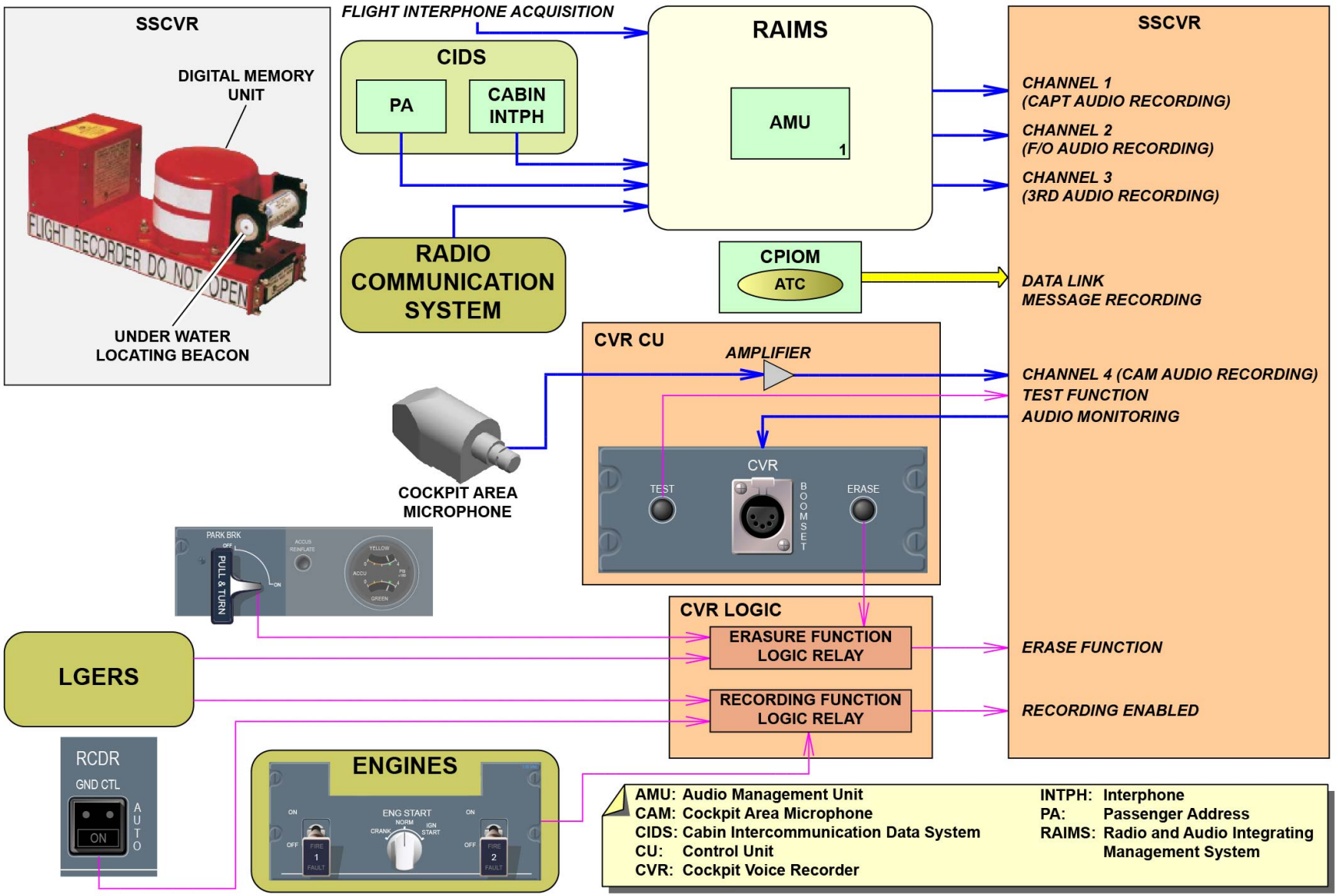
Test function

The test function which is controlled from the TEST P/BSW of the CVR CU does a test of the CVRS. The CVRS must be in recording mode to do the test.

Erase function

The audio erase function which operates from the ERASE P/BSW of the CVR CU erases only the audio communications from the memory of the CVRS. This action does not erase the data link communications. The erase function is available only on ground with the parking brake set to ON. The Brake Control System (BCS) gives the parking brake the on or off configuration.

V2414251 - V00T0MM0 - VM23D7CVRS03001



DESCRIPTION - RECORDING LOGIC ... ERASE FUNCTION

EMERGENCY LOCATOR TRANSMITTER SYSTEM DESCRIPTION (2/3)

Emergency Locator Transmitter (ELT) Function

The function of the ELT system is to transmit distress and location signals in emergency situations. This helps the search-and-rescue team to identify the A/C and to find its location.
There are two ELT systems installed in the A/C:
- An automatic fixed ELT connected to a dedicated transmission antenna
- One or some portable-survival ELTs installed with their own antenna.

Automatic fixed ELT
The automatic fixed ELT, installed in the top aft section of the A/C fuselage, can be activated:
- Either manually by the crew through the ELT remote control panel in the cockpit or through the ELT control panel on the ELT
- Or automatically if there is an important deceleration (about 5g) event (big impact, etc.).

Two different models of automatic fixed ELTs are proposed (ELTA and KANNAD).
In relation to the selected model, the automatic fixed ELT can be attached (or not) with a backup antenna installed on the ELT transmitter itself.
The A/C registration information is stored in two different devices (adapter cable or transmitter board).
Portable survival ELT
The portable survival ELT, installed on different A/C locations (e.g.: overhead compartments, doghouse, etc.), can be activated:
- Manually by the crew, if there is an emergency. Manual activation is made through a dedicated switch on the ELT.
- Automatically, if it is put into water.

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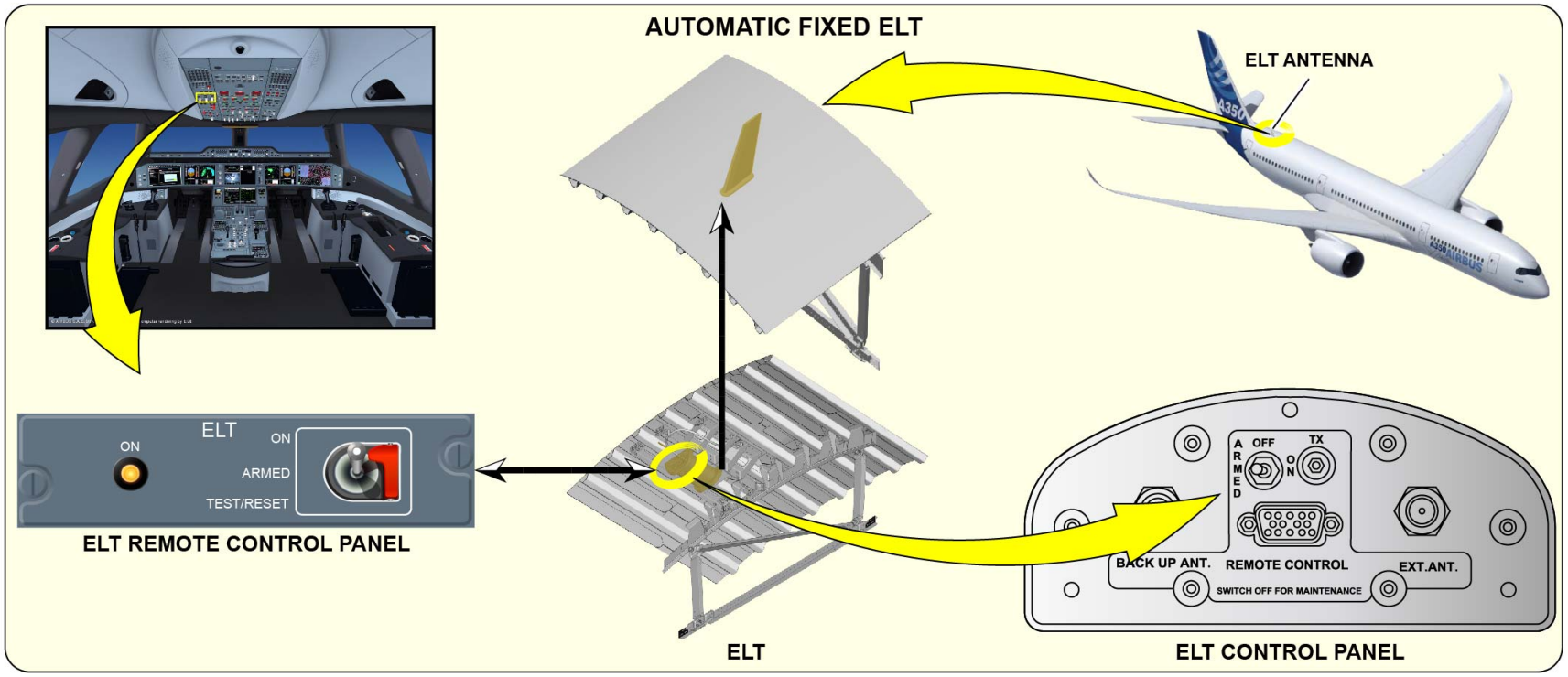

ELT: Emergency Locator Transmitter

ELT FUNCTION:

TO TRANSMIT DISTRESS SIGNALS IN EMERGENCY SITUATIONS (MAINLY FOR AIRCRAFT LOCALIZATION)

EMERGENCY LOCATOR TRANSMITTER (ELT) FUNCTION

EMERGENCY LOCATOR TRANSMITTER SYSTEM DESCRIPTION (2/3)

Automatic Fixed ELT System Description

For at least 24 hours of operation, the ELT system transmits an emergency digital message (on 406 MHz) to a dedicated rescue satellite-constellations to localize the emergency event zone. This digital message includes A/C registration data and ELT data.
The satellites (COSPAS-SARSAT constellation) receive these signals and calculate the position of the A/C. The satellites send these data to the ground stations. The ground stations use these data to identify the A/C zone.
The ELT system also transmits distress signals (on 121.5 MHz and 243 MHz) continuously for a minimum of 48 hours to help the rescue teams to find the A/C.
The fixed ELT system has:
- An ELT transmitter
- An external antenna connected to the transmitter with a coaxial cable
- A remote control panel.

The ELT transmitter has:
- An internal acceleration sensor (G-switch) which senses the crash and starts the ELT operation
- A battery pack.

In relation to the ELT transmitter installed onboard the A/C, an optional navigation module can also be integrated in it.
The function of this navigation module is to receive and to memorize the A/C position from the Air Data/Inertial Reference Units (ADIRUs). Then, this position is sent to the satellite constellation through the ELT antenna to get a more accurate A/C position for rescue researches.
The remote control panel gives the control of the ELT system from the cockpit.
It is possible to control the start of the ELT operation and also to stop unwanted transmission through the remote control panel. It has an ON indicator light and a control switch with a guard.
The remote control panel has an interface with the ground horn to inform the ground crew that the ELT transmits.

NOTE: WARNING: MAKE SURE THAT THERE ARE NO PERSONS IN A RADIUS OF A MINIMUM OF 5 M AROUND THE NOSE LANDING GEAR. WHEN THE MECHANIC CALL HORN OPERATES, THE SOUND LEVEL IS MORE THAN 110 DB.
CAUTION: AFTER THE END OF THE BITE TEST, IMMEDIATELY STOP THE OPERATION OF THE ELT. IF THE ELT OPERATES MORE THAN 30 SECONDS AFTER THE BITE TEST IS COMPLETED, IT WILL AUTOMATICALLY TRANSMIT DISTRESS SIGNALS. THIS WILL START SEARCH AND RESCUE OPERATIONS.

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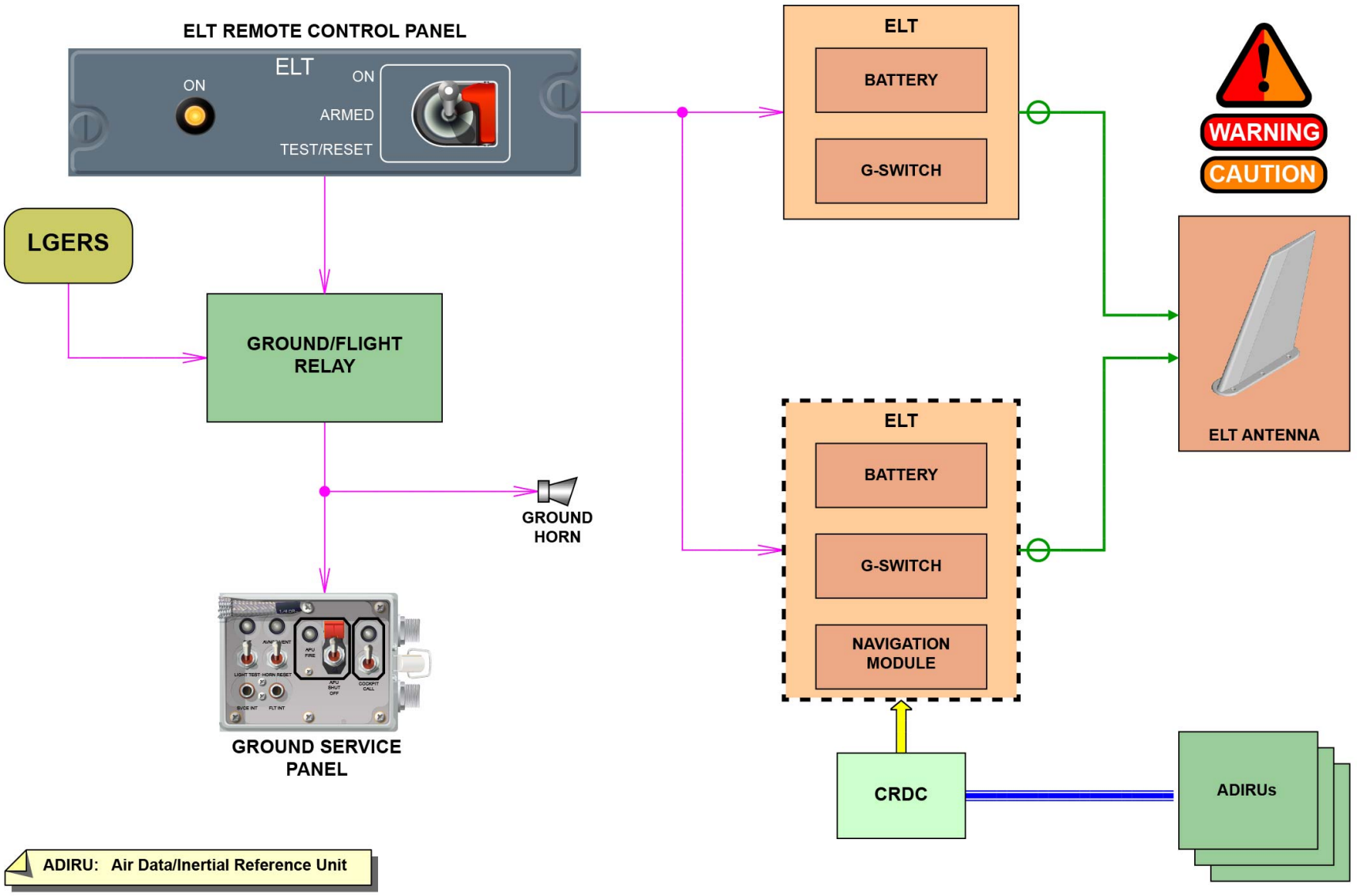


AUTOMATIC FIXED ELT SYSTEM DESCRIPTION

EMERGENCY LOCATOR TRANSMITTER SYSTEM DESCRIPTION (2/3)

Automatic Fixed ELT Manual Control

Automatic mode
In automatic mode, the ELT system starts to operate automatically when the G -switch senses a sufficient force to start the transmission of distress signals.
During an automatic operation, the control switch on the remote control panel and on the ELT must be in the ARMED position. This is the usual position of the two control switches. When the G-switch senses sufficient force, the ELT starts to transmit after a standby period (30 seconds).
During the standby period, the Transmit (TX) indicator light and the buzzer on the ELT operate intermittently.
When the ELT operation starts, the TX indicator light and the buzzer on the ELT operate at a higher frequency. The ON indicator light on the remote control panel also flashes during the transmission.
Manual mode
It is necessary to operate the ELT system manually, if:
- The G-switch does not start the transmission automatically during an emergency
- It is necessary to stop the ELT system to do maintenance or to stop unwanted transmission.
When the ELT transmits on ground, the ground/flight relay receives the weight on wheels indication from the LGERS and makes the ELT indicator light on ground Service Panel (GSP) of the NLG illuminate, and the horn at the NLG bay operate.
It is possible to stop the ground horn and the ELT indication light through the HORN RESET control switch on the GSP.
It is possible to operate the ELT system manually through the remote control panel and also through the ELT.
- Manual operation through the remote control panel
For manual operation through the remote control panel, the control switch on the ELT must be in the ARMED position. Then, you must set the control switch on the remote control panel to the ON position.
After the self-test, the ON indicator light stays on during a (30 second) standby period. Then, the ON indicator light operates intermittently during the signal transmission.
- Manual operation through the ELT transceiver
For manual operation through the ELT, the control switch on the ELT must be in the ON position.
After the self-test, during signals transmission, the TX indicator light and the buzzer operate at a high frequency.
Deactivation of the ELT system
It is necessary to deactivate the ELT system if there is an unwanted transmission of distress signals or before you do maintenance.
For the deactivation to stop unwanted transmission, the control switch on the remote control panel is set to the TEST/RESET position. To deactivate the ELT system for maintenance, the control switch on the ELT must be set to the off position.
System Test
The BITE of the ELT system is a Local Maintenance Function (LMF), that operates fully independently from the Central Maintenance System (CMS). It is a self-test. The test is available through the control switch on the remote control panel in the cockpit and also through the control switch on the ELT. This test does a check of the integrity of the ELT and of the external antenna connection.
Each time, before the ELT starts to operate, the self-test starts automatically. It is also possible to start the self-test manually through the control switch on the ELT remote control panel or on the ELT.
The self-test starts through the remote control panel when the control switch is set and hold to the TEST/RESET position.
The ON indicator light on the remote control panel and the TX indicator light on the ELT show the results.

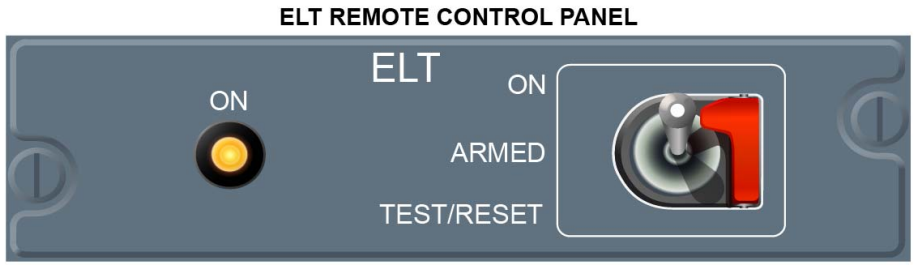
V2414251 - V00T0MM0 - VM23DAELTS03001

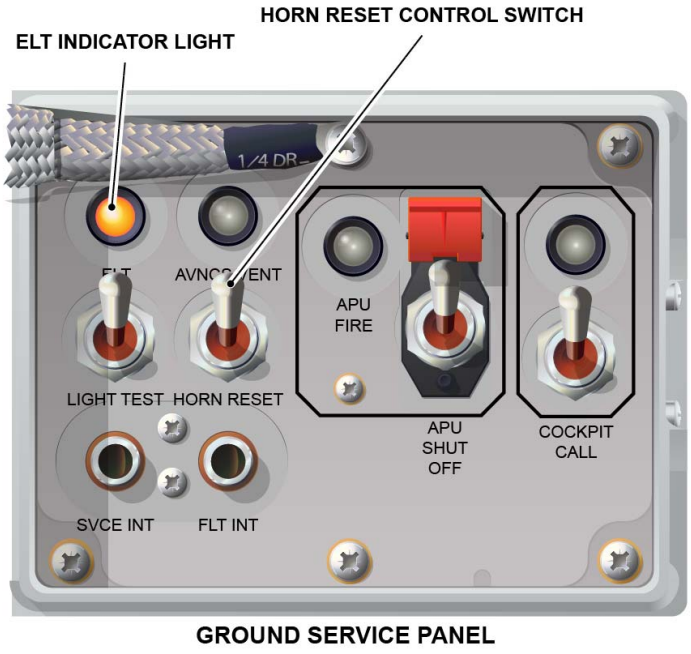
ELT MANUAL CONTROL IF:

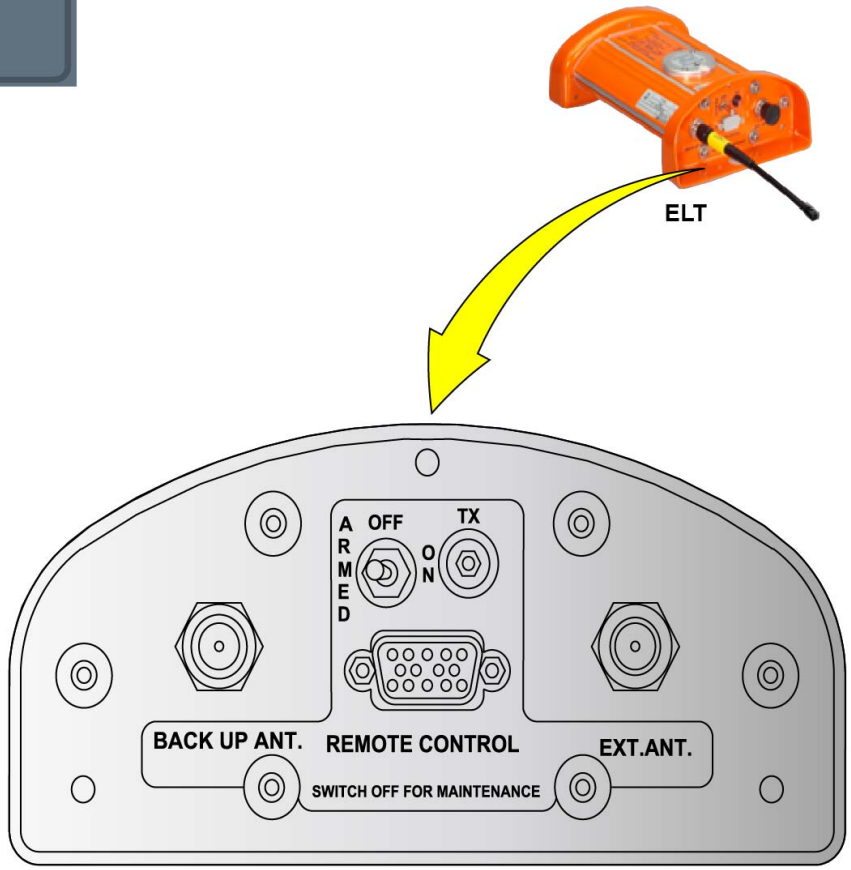
- THE G-SWITCH DOES NOT START THE TRANSMISSION

OR

- TO STOP ELT TRANSMISSION FOR MAINTENANCE OR IF THERE IS UNWANTED TRANSMISSION







AUTOMATIC FIXED ELT MANUAL CONTROL

COMMUNICATION SYSTEMS CONTROL AND INDICATING (2/3)

RMP Presentation (2)

This Control / Indicating module provides a general presentation of the RMP (Radio and audio Management Panel) main page access keys.
HF / VHF pages mainly allow:
- the selection and modification of a HF / VHF frequency in the STBY field,
- make the modified STBY frequency active,
- setting of the VOICE or DATA Mode.

TEL page is covered within SATCOM system.
SQWK and NAV pages are covered within ATA 34.
MENU page gives access to both DATALINK ROUTER and SATCOM CONFIG pages.
SATCOM CONFIG page is covered within SATCOM system
DATALINK ROUTER page is covered within ACRS
The BRIGHT/OFF Potentiometer is used to switch on or OFF the RMP and to dim the RMP screen.
The ON/OFF Indicator is:
- Green when the RMP is OFF and operative,
- RED when the RMP is failed (OFF or ON),
- Extinguished when RMP is ON and operational.

RST key allows to RESET the aural call alerts (linked to a SELCAL/CALL) (INTerphone/RADio) PTT switch is used for the radio communication and interphone modes.
The description of the Transmission keys & Reception knobs, Numerical keypad, UP/DOWN keys, Activation / Dialing Keys (ADK) & Line Selection Keys (LSK) is provided in the other templates of ATA 23.

Use of HF (2)

This Control / Indicating module explains how to set the HF (or VHF) frequency and initialize a HF transmission by using Transmission keys & Reception knobs, Numerical keypad, UP/DOWN keys, INT/RAD PTT switch, ADKs & LSKs.
The following sequence has to be followed to set a new HF (or VHF) frequency and to initiate a voice communication:
Press HF main page.
Press LSK1 to select HF1 STBY frequency (HF1 STBY frequency is selected with the blue selection box).
Enter the frequency with the keyboard and validate it with LSK1 key.
Activate the frequency with ADK1.
Press HF1 transmission key to select HF1 in transmission mode (3 green bars appear on transmission key).
Push HF1 reception knob and adjust the volume with the potentiometer (a white skirt appears on the potentiometer and a Loud Speaker symbol is displayed near HF1 label).
To transmit on HF1: activate one of the PTT switch and release it. Wait until you can hear the 1000Hz tone (which means that HF system is now tuned and ready to transmit). After the tuning, voice communication can be established by activating again the PTT switch.
HF DATA transmission is automatically inhibited on ground. The GND HF DATALINK Push Button allows overriding.
Note that there is synchronization between all RMPs via dialog buses. It is therefore possible to control all HF 1 & 2 & 3 frequencies from any RMPs.

Setting VDR3 to DATA / VOICE MODE (3)

In normal operation the VDR3 is basically set in DATA Mode. It can be required to use VDR3 in Voice mode (as a backup system for example).
Note that in DATA Mode, VDR3 is tuned directly by the ACR.

SATCOM (2)

This Control / Indicating module provides a general presentation of the SATCOM main page access keys.

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TEL page mainly allows:
- to select a telephone channel and to dial a number or to start a communication via the SATCOM,
- to select of a pre-recorded telephone number from the list of the ORT (Owner Requirement Table) by using the UP and DOWN keys,
- to start a communication (*DIAL function) and to end it (*END function).

MENU page gives access to both DATALINK ROUTER and SATCOM CONFIG pages.
SATCOM CONFIG page allows consulting, configuration and setting of SATCOM parameters:
- Log off and log on the SATCOM status,
- Enable/Disable the cabin calls (as an option),
- Consult the ICAO code,
- Select the Automatic Log-On (with default GES (Ground Earth Station) and SAT),
- Select the Manual Log-On within the SATCOM SETTINGS sub-page (with GES and SAT manually selected by the user).

Avionics Communication Routing System (ACRS) (2)

This Control / Indicating module provides a general presentation of the ACRS.
From RMPs:
MENU page gives access to DATALINK ROUTER page.
DATALINK ROUTER page allows to access to:
- INIT page which shows A/L IDENT & A/C registration (only for consultation)
- COM STATUS page which shows the ACR status of HF & VHF & SATCOM (VOICE or DATA).

VHF PROVIDER page (not simulated): for manual selection of a VHF provider for ex.
From OMT:
From OMT Maintenance Home Page, select "Utilities" and then select "A/C COM Status".
This page gives the A/C communication status ("OK, NOT AVAIL, CONNECTED...) of the WACS means (WIFI, Cellular, Wired), SATCOM SBB (or High Speed), ACARS means (HF & VHF & SATCOM) "Disable link" and "Enable Link" function is available.

Read and modify SELCAL code (3)

The SELCAL function provides both visual and aural indications to the flight crew when the A/C receives a selective call from ground stations via HFDR or MVDR channels.
The SELCAL Code is part of the message sent from the ground stations.
The SELCAL code can be identified from OMT. If modification is needed, a function is available on the identification page to enter a new value.

SELCAL Operation (2)

In case of an incoming SELCAL, the CALL light illuminates in amber on the relevant key (HF, VHF key), the buzzer sounds, and the RMP RST key light comes on in amber. To establish the communication, it is required to select the relevant transmission key and reception knob.
By selecting the relevant transmission key (HF or VHF):
- The CALL legend goes off,
- The GREEN lines on the transmission key come on,
- The buzzer stops,
- The RST legend on the RST key goes off.

If the flight crew does not want to answer the incoming SELCAL, it presses the RST key. As a result, the Buzzer sound is cancelled, and the RST light goes off.

Ground Mechanic Call and Flight Interphone (2)

A Ground mechanics at the nose landing gear can call the cockpit crew by using the COCKPIT CALL toggle switch located on the Ground Service Panel.

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When the COCKPIT CALL toggle switch is activated, in the cockpit on the 3 RMPs the amber light MECH flashes to indicate an incoming call from the ground crew. The light flashes for 60 sec at the most, or until the cockpit crew answers the call.
Associated to the amber light MECH, a buzzer continuously sounds as long as the ground crew maintains down the COCKPIT CALL toggle switch. In the cockpit, the buzzer can be cancelled by pressing the RST pushbutton on any RMPs.
On the other hand, it is possible to call from the cockpit the Ground Crew at the nose landing gear by using the CALLS/MECH pushbutton on the Cockpit Call panel.
First, on RMP push the INT transmission key and Reception knob. When the CALLS/MECH pushbutton is activated in the cockpit, the blue COCKPIT CALL indicator light comes on at the Ground Service panel and the horn in the nose gear well operates as long as you push the CALLS/MECH pushbutton switch. When the CALLS/MECH pushbutton is released, the external horn stops but the indicator light remains on. This indicator light goes off when the HORN RESET pushbutton switch located on the Ground Service panel is activated.

Cockpit Voice Recorder System (CVRS) (2)

The GND/CTL P/B override automatic recording logics. When set to ON, Cockpit Voice and Flight Data recorders are in recording mode when the A/C is on ground with both engines shut down.
The CVR TEST P/B lets you test the CVR. When pressed in, you can hear a 600Hz tone in a boomset connected to the CVR panel to confirm the good operation of CVR.
The ERASE pushbutton must be pressed for 2 seconds minimum to erase to content of the SSCVR. Note that the voice communications data only are erased. The ATC data recorded are not affected. The CVR confirms erasure with a 400 Hz tone heard in a boomset connected to the CVR panel. The erase function is available only on the ground with parking brake ON.

External Video System (2)

On the glareshield when the TAXI P/B on CAPT (F/O) EFIS Control Panel is pushed, the Green lines on TAXI key come on and the TACS (TAXI AID CAMERA System) Video image is displayed on CAPT (or F/O) PFD.
On the ECAM Control Panel when the VIDEO P/B is pushed the TACS Video image is displayed on ECAM SD.
The LANDSCAPE P/B on Overhead Panel (ICP-MID L) allows the flight crew to switch off, from the cockpit, the LANDSCAPE Video image in the cabin.
The VIDEO Rotary Switch on pedestal allows to display alternatively the TACS & CDSS & CMVS images on ECAM SD.
Note that:
- The TACS is basically installed on the A350-1000 version. It is an option on A350-800 and A350-900.
- The LANDSCAPE Camera is an option on A350 versions.
- The TACS image can be optionally sent to the IFE system for display to passengers.

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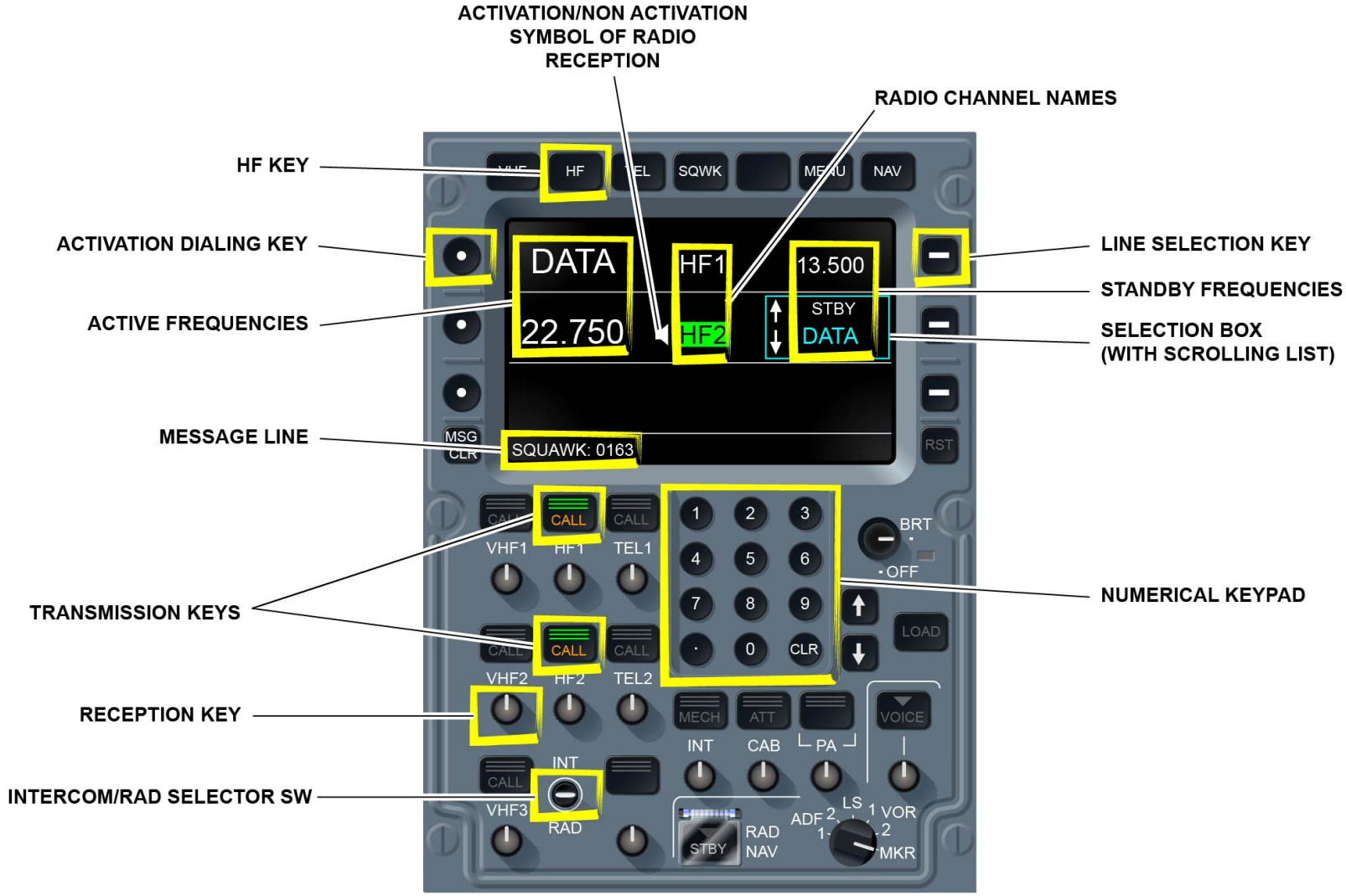
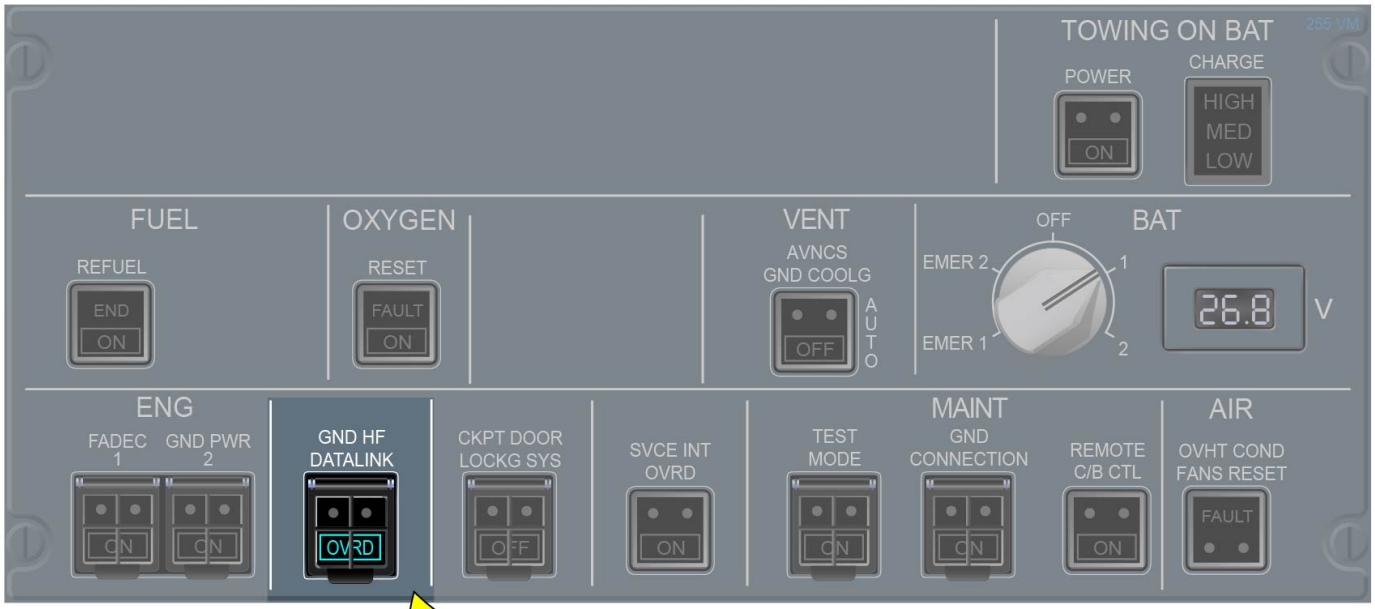
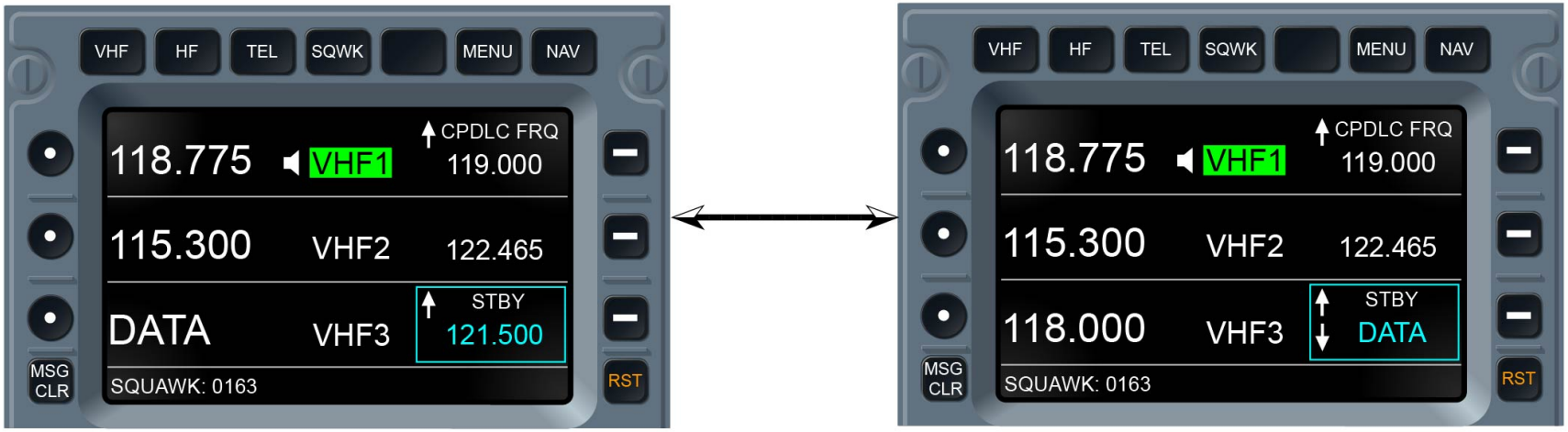


RMP PRESENTATION (2) ... EXTERNAL VIDEO SYSTEM (2)



MAINTENANCE ICP

RMP PRESENTATION (2) ... EXTERNAL VIDEO SYSTEM (2)



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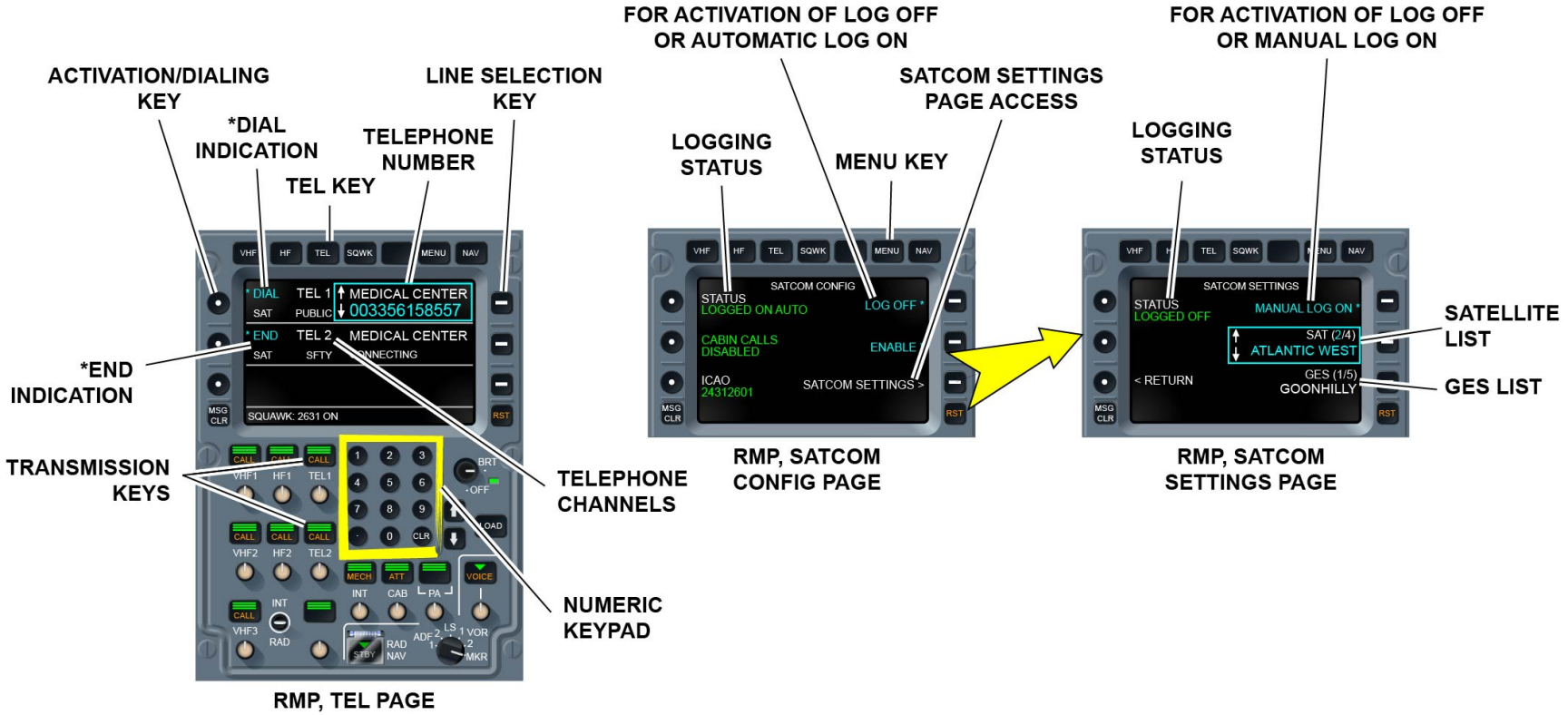

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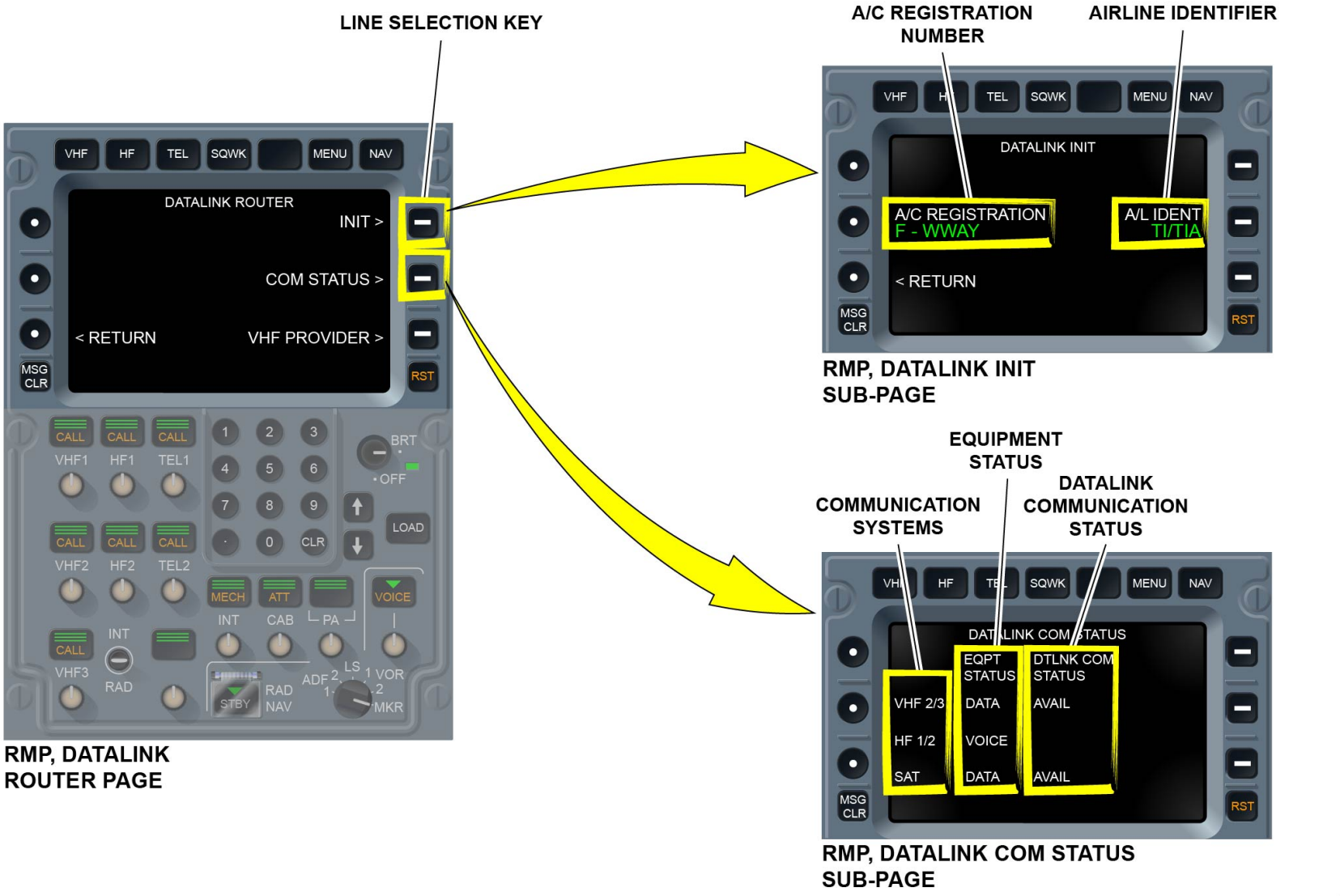

RMP PRESENTATION (2) ... EXTERNAL VIDEO SYSTEM (2)

A/C COM STATUS

RMP PRESENTATION (2) ... EXTERNAL VIDEO SYSTEM (2)

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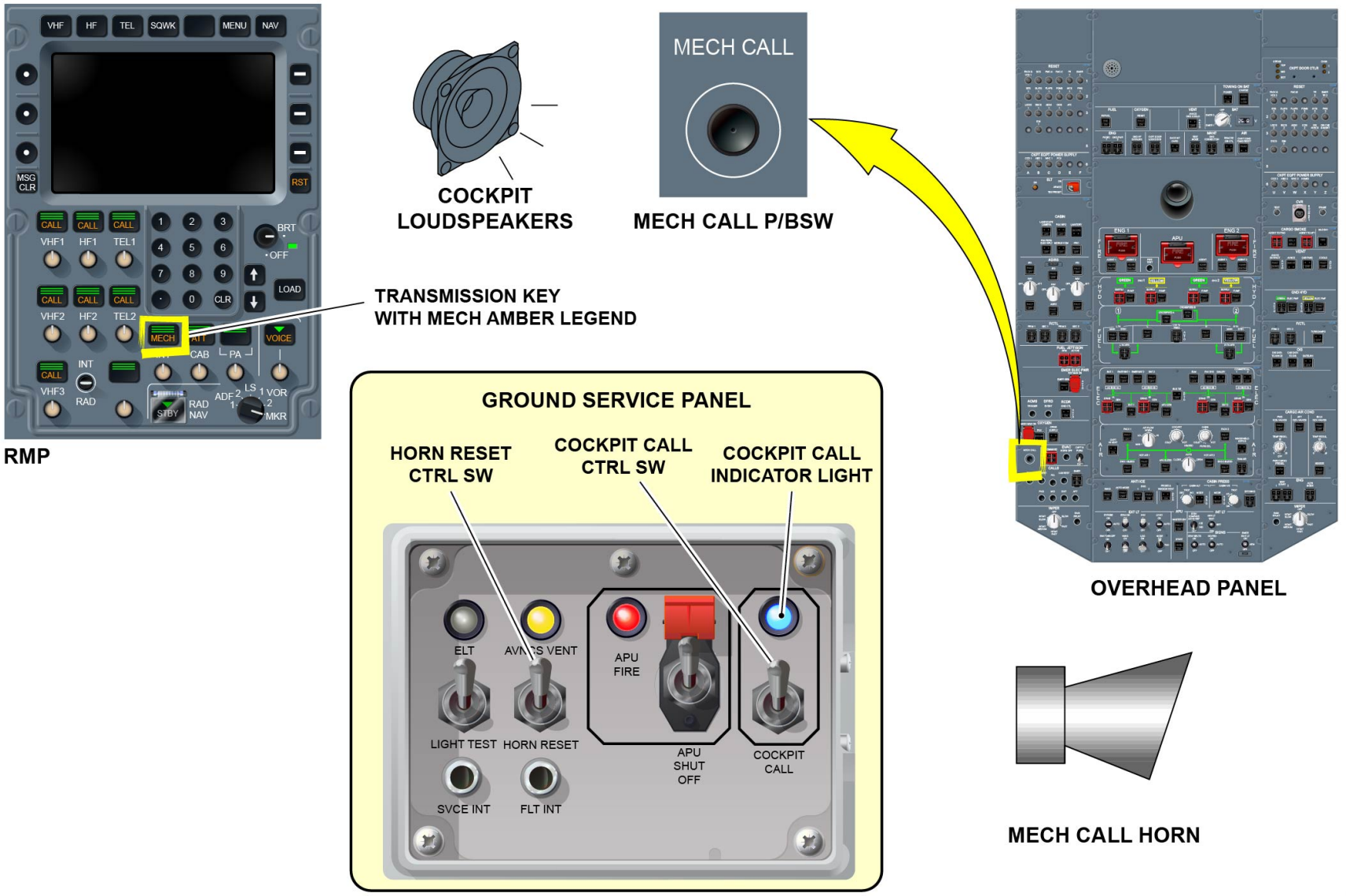
SELCAL INDICATION ON VHF 1 & 2

RMP

RMP PRESENTATION (2) ... EXTERNAL VIDEO SYSTEM (2)



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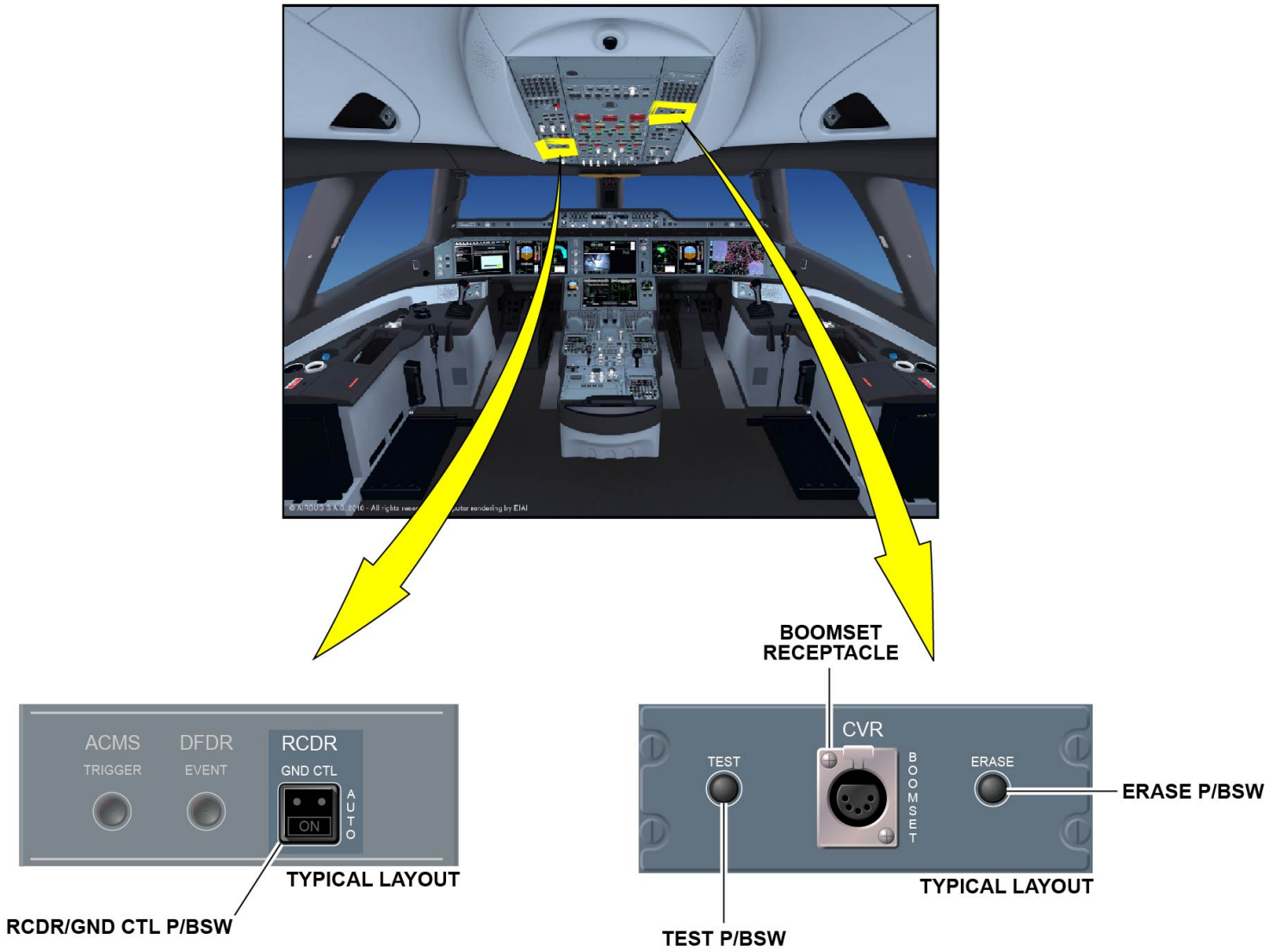

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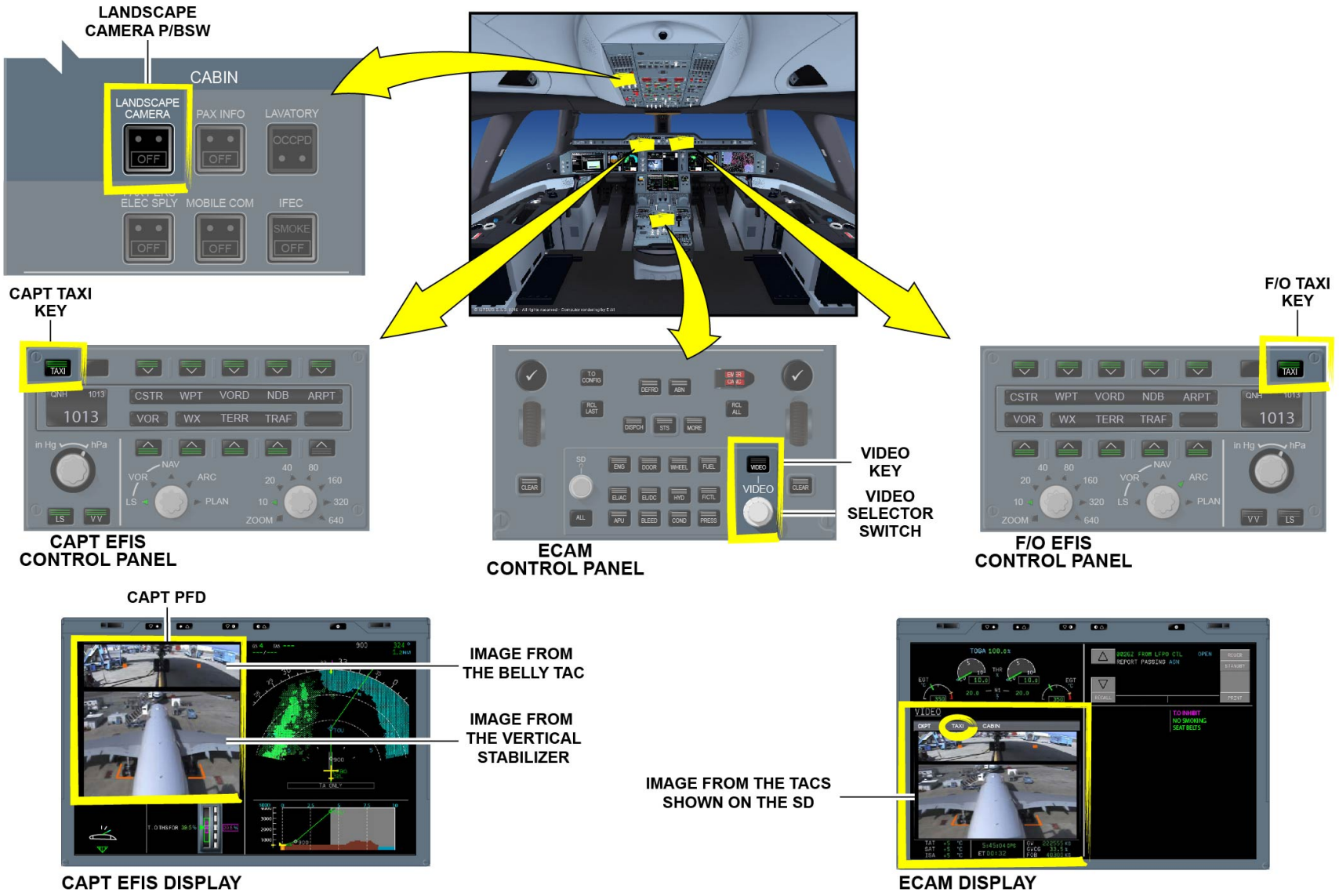

RMP PRESENTATION (2) ... EXTERNAL VIDEO SYSTEM (2)

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